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MS-7024 **IBM Wellfleet**

Version 130

Intel (R) Springdale (GMCH) + ICH5 Chipset
Intel Northwood & Prescott mPGA478B Processor

CPU:

Intel Northwood/Prescott - 3.0G & Above

System Chipset:

**Intel Springdale - GMCH (North Bridge)
Intel ICH5 (South Bridge)**

On Board Chipset:

**BIOS -- FWH EEPROM
AC'97 Codec -- AD1981B
LPC Super I/O -- LPC47M233
LAN -- I82562EZ(10/100) / I82541EI(Giga)
CLOCK -- Cypress CY28405**

Main Memory:


DDR * 2 (Max 2GB)

PCI Slots:

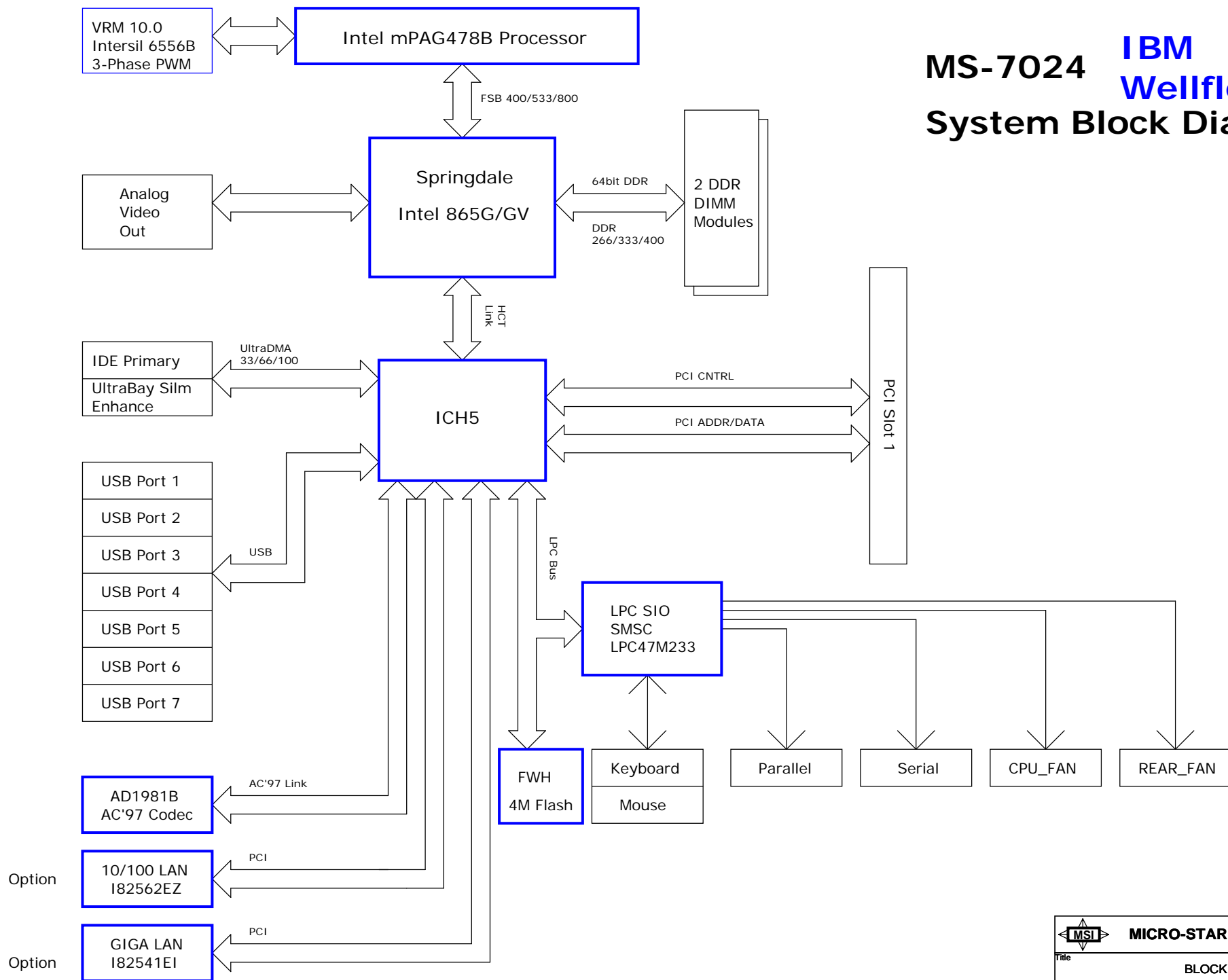
PCI2.3 SLOT * 1

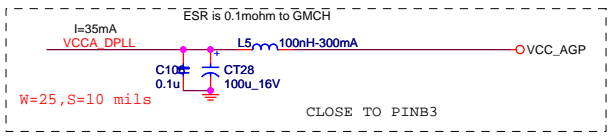
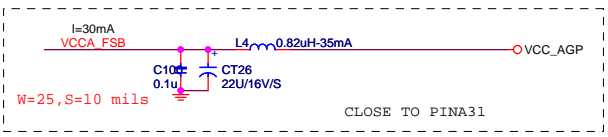
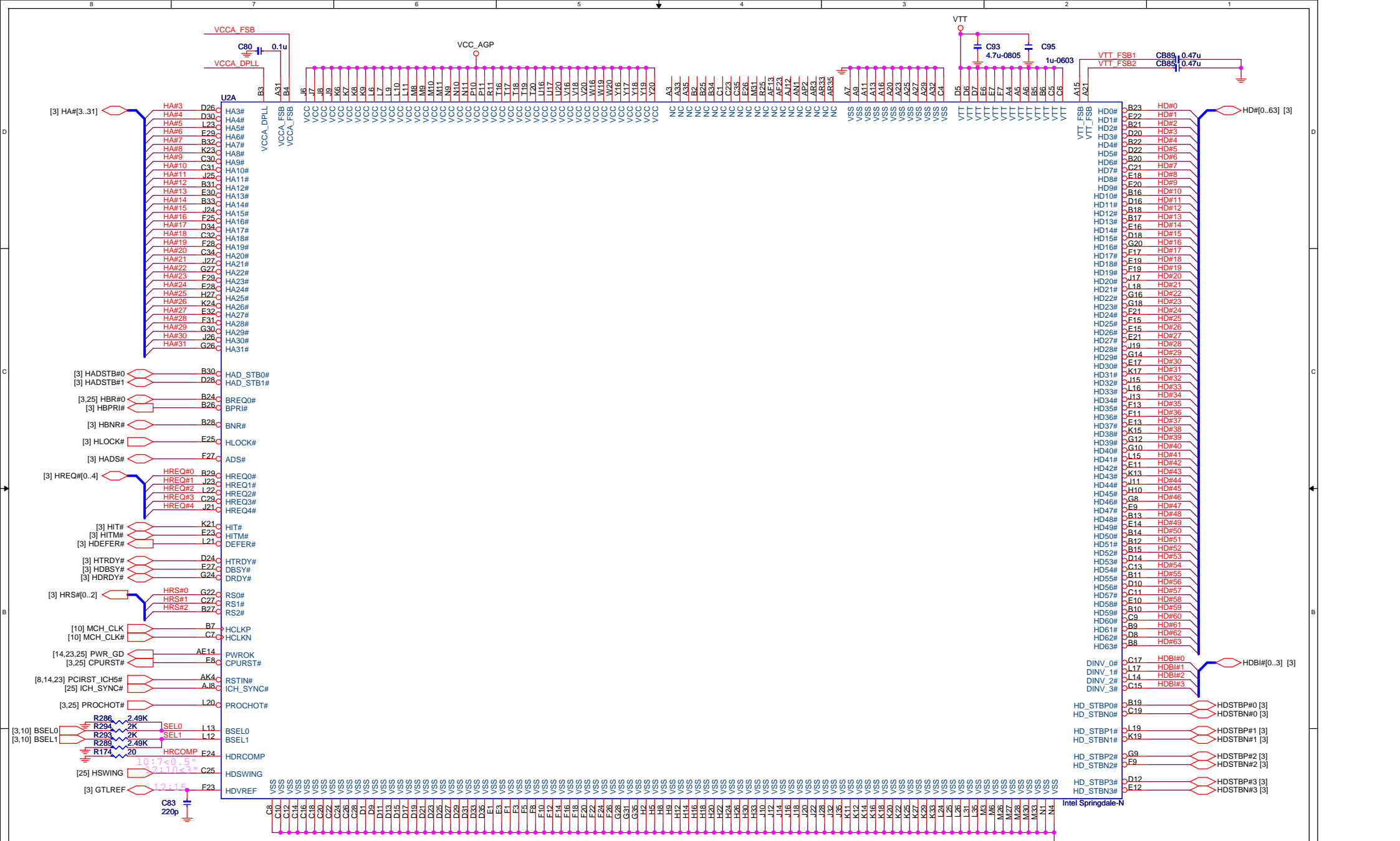
Intersil PWM:

**Controller: HIP6556B (HIP6565)
Driver: HIP6602B *1 / HIP6601B * 1**

		MICRO-STAR INT'L CO., LTD.	
Title		COVER SHEET	
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MS-7024 **IBM Wellfleet** System Block Diagram



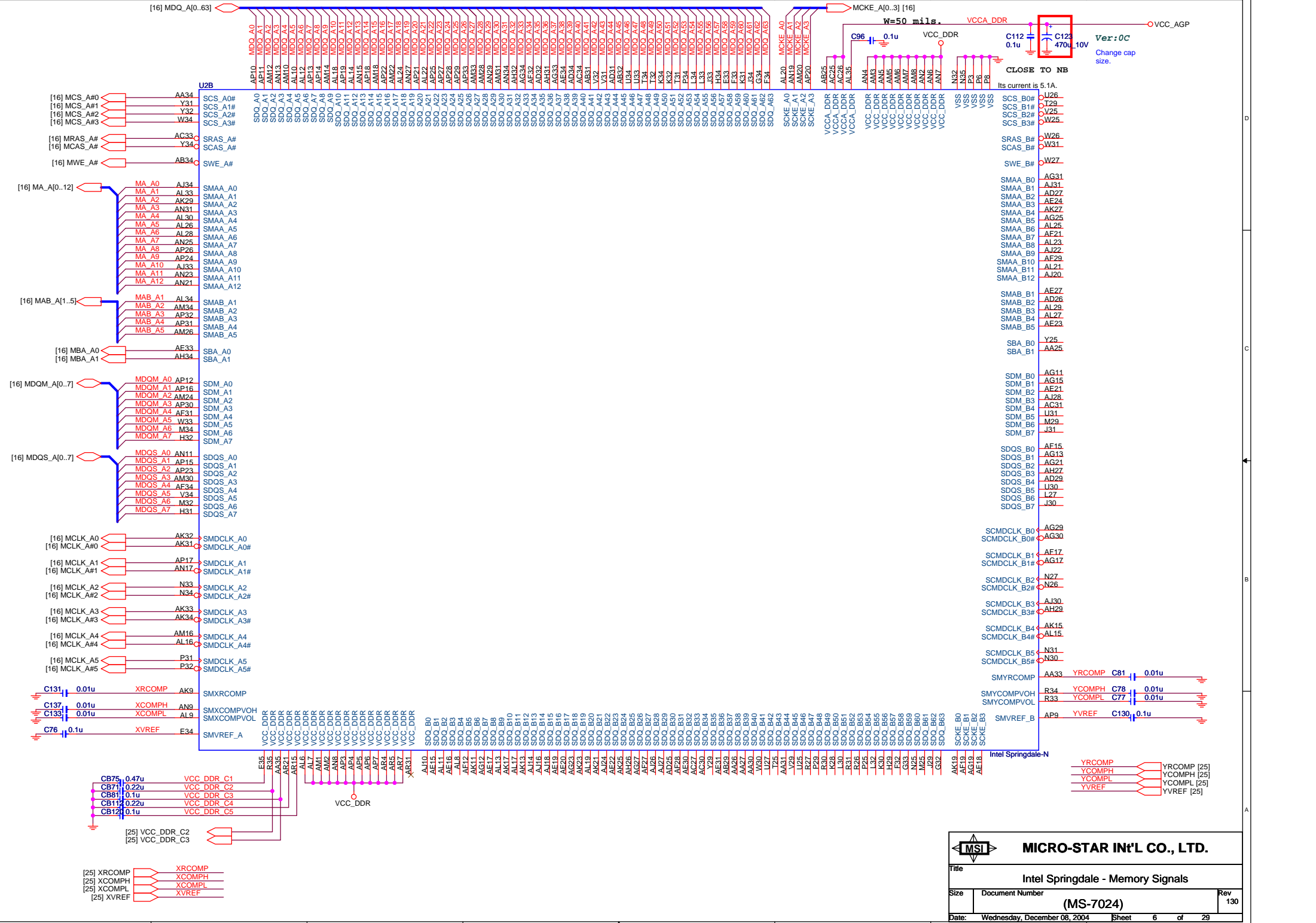


MSI MICRO-STAR IN'L CO., LTD.

Title: Intel Springdale - CPU Signals

Size	Document Number	Rev
	(MS-7024)	130

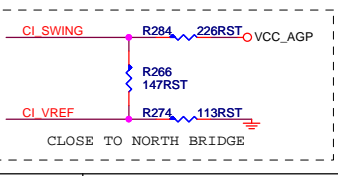
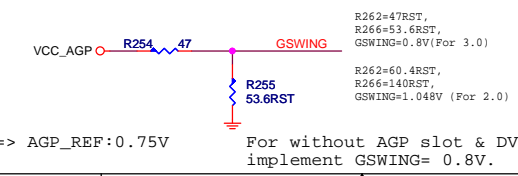
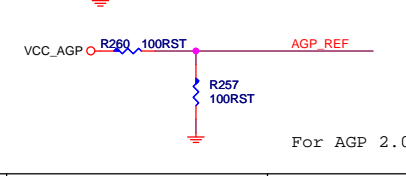
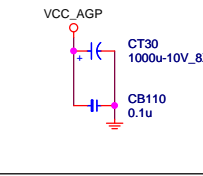
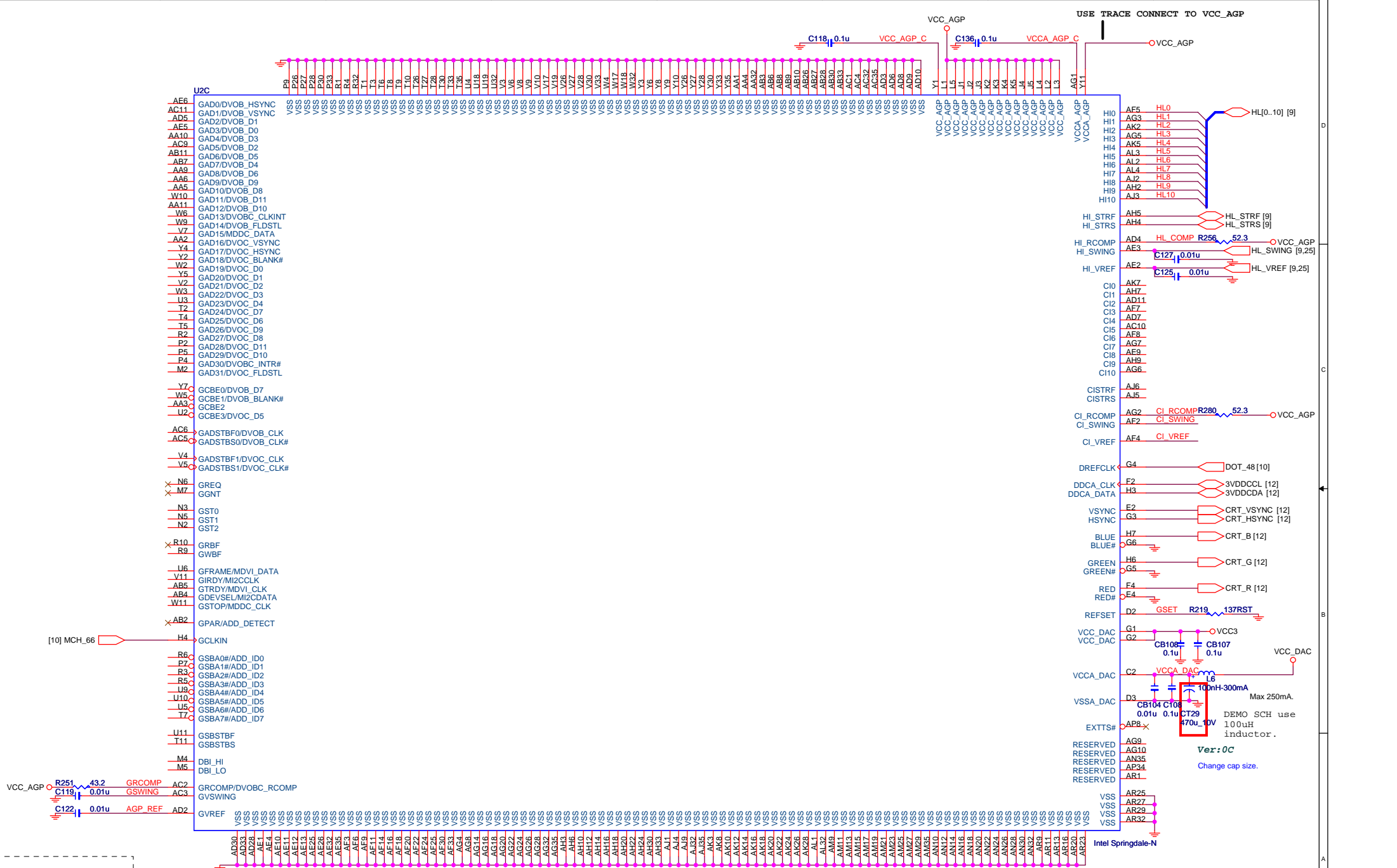
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MSI **MICRO-STAR INT'L CO., LTD.**

Title: **Intel Springdale - Memory Signals**

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Date:	Wednesday, December 08, 2004		Sheet 6 of 29



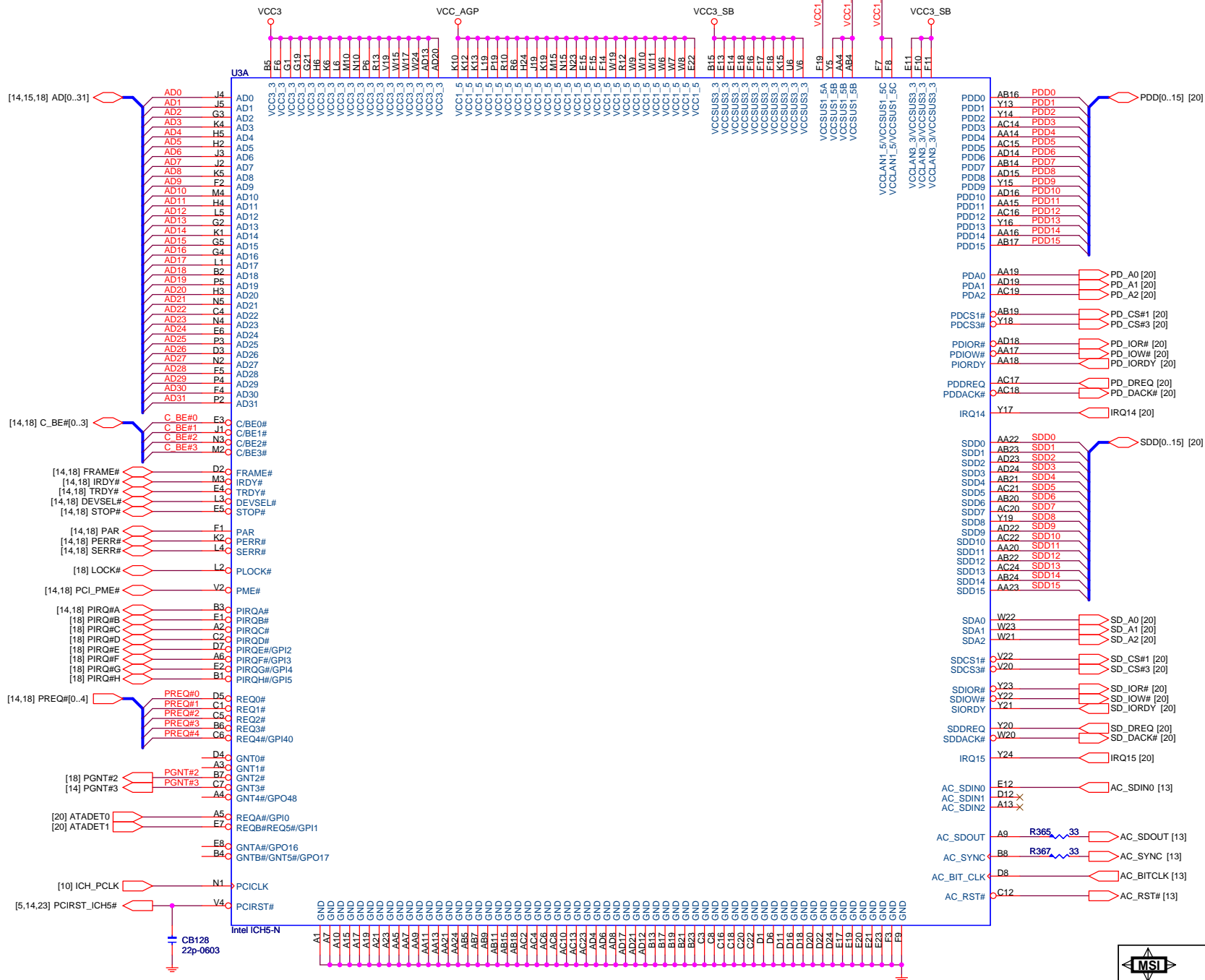
MSI

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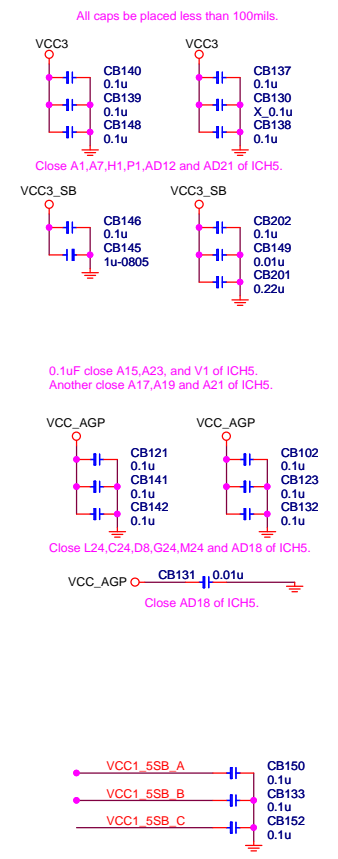
Title: Intel Springdale - AGP & HLink & LAN Signals

Size	Document Number	Rev
	(MS-7024)	130

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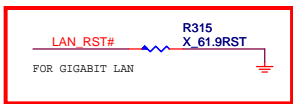
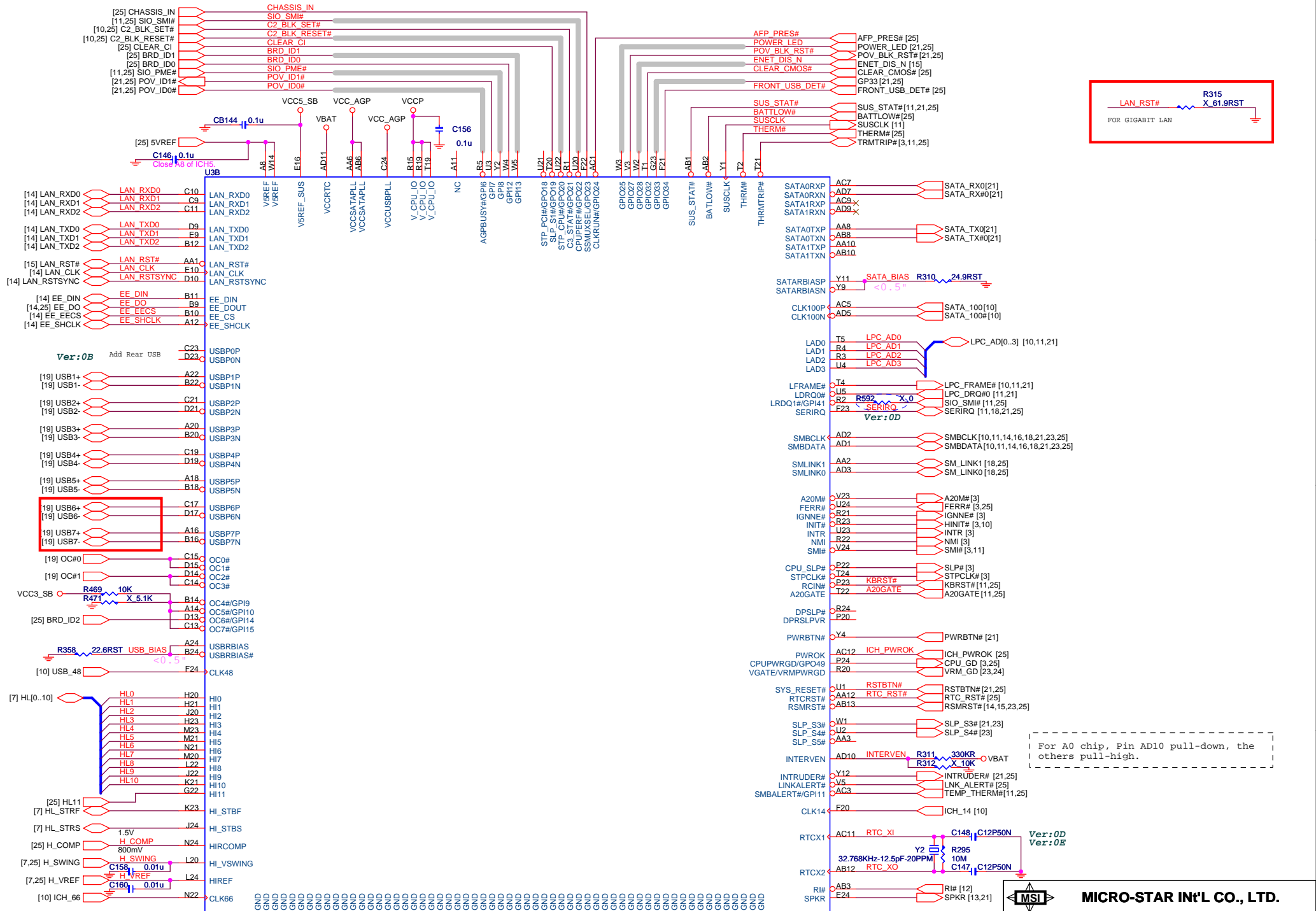


ICH5 Decoupling Capacitors



MICRO-STAR IN'L CO., LTD.

Title			Intel ICH5 - PCI & IDE & AC97 Signals		
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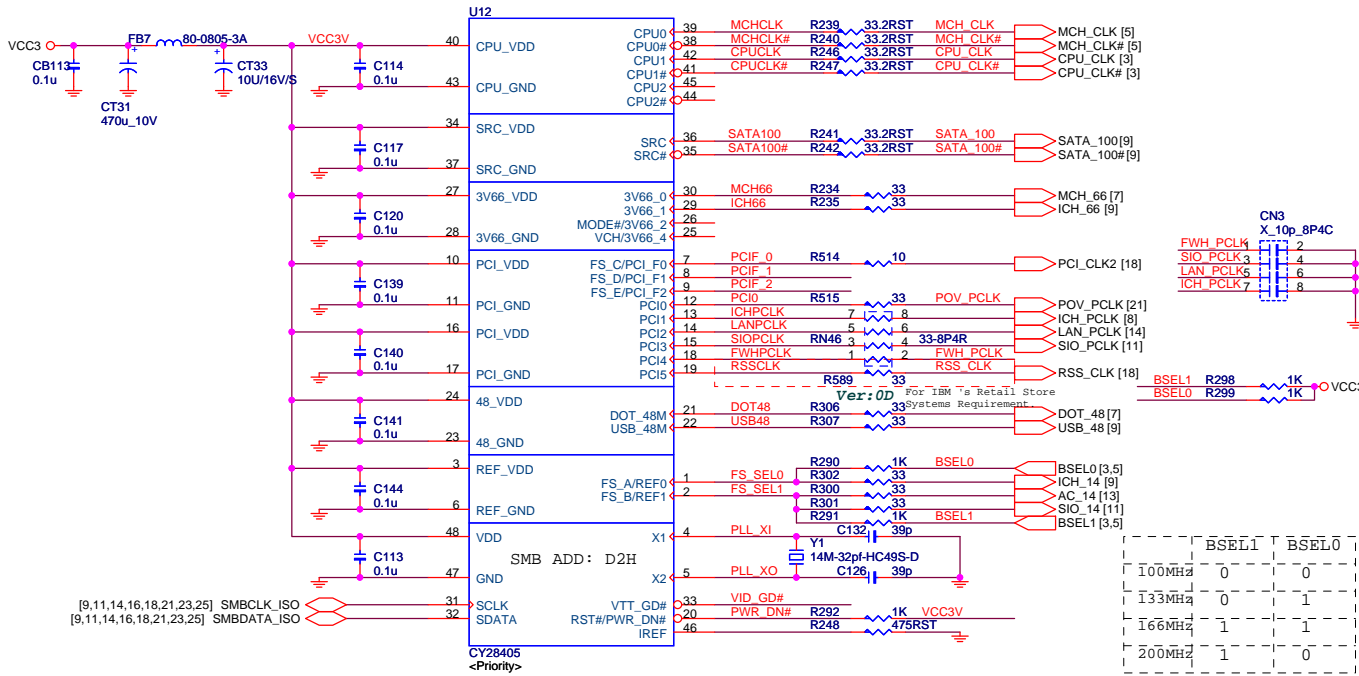
For A0 chip, Pin Ad10 pull-down, the others pull-high.

MSI

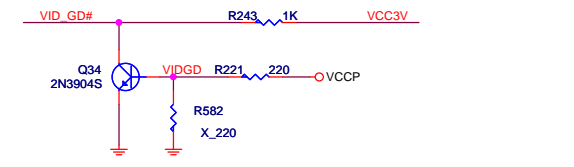
MICRO-STAR INT'L CO., LTD.

Title			Intel ICH5 - Other Signals
Size	Document Number		Rev 130
(MS-7024)		Date:	Wednesday, December 08, 2004
		Sheet	9 of 29

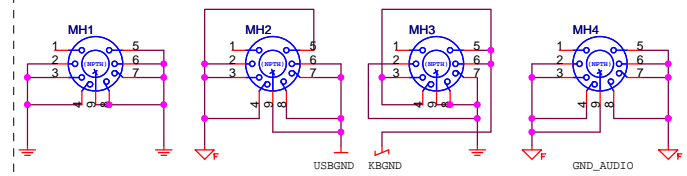
CLOCK GENERATOR



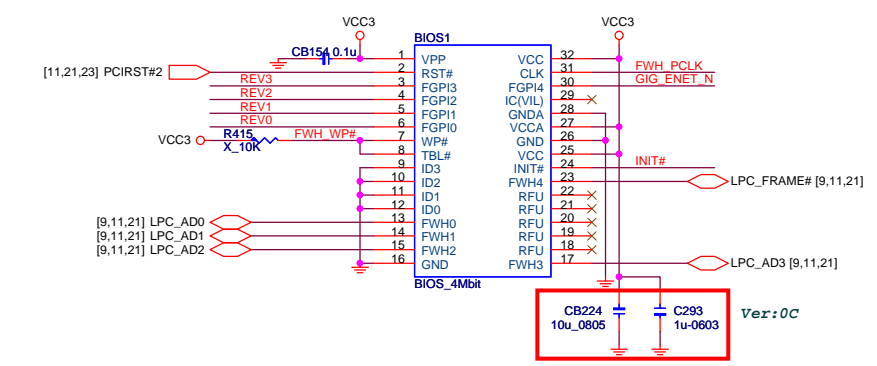
CLOCK GENERATOR VTT POWER DOWN BLOCK



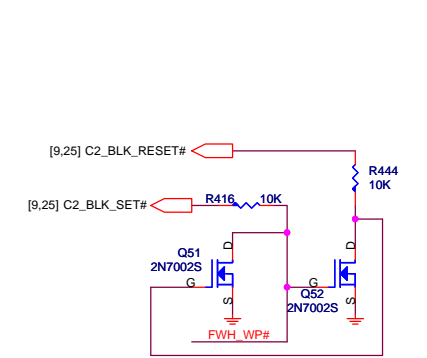
Mounting Holes



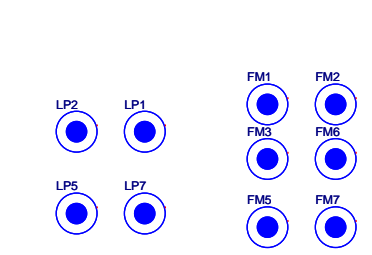
FIRMWARE HUB (FWH)



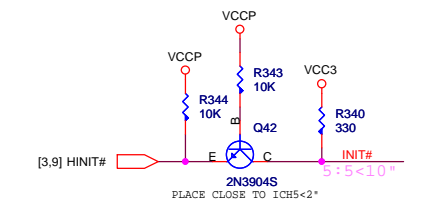
FWH WRITE PROTECT CIRCUIT



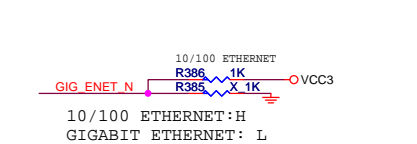
Optics Orientation Holes



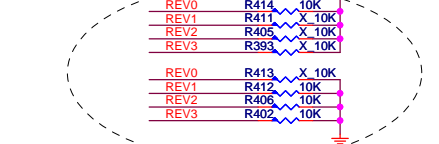
FWH INIT Signal Voltage Translation



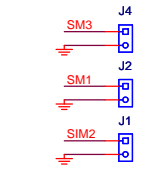
ETHERNET STRAPPING RESISTORS



PCB REVISION ID



Simulation



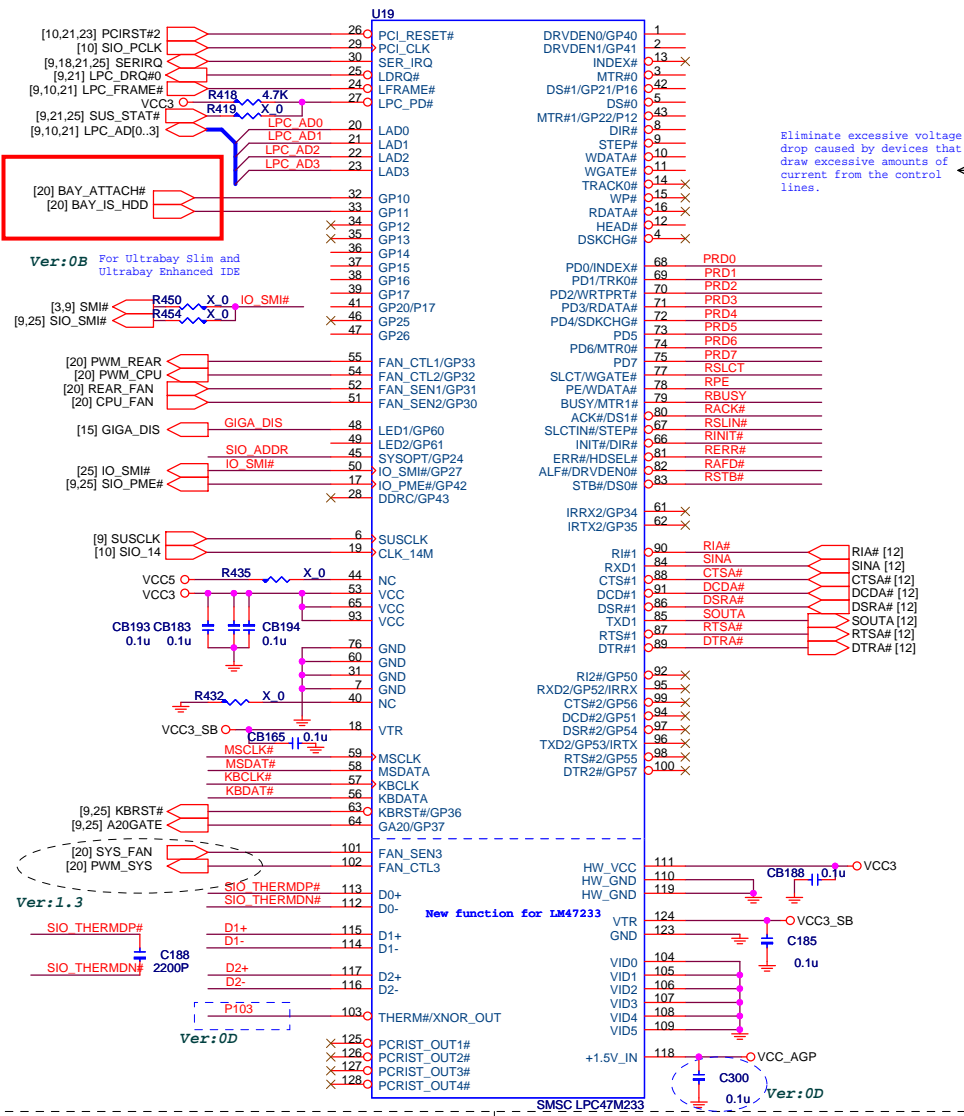
MSI MICRO-STAR IN'L CO., LTD.

Title: **CY28405 & FWH**

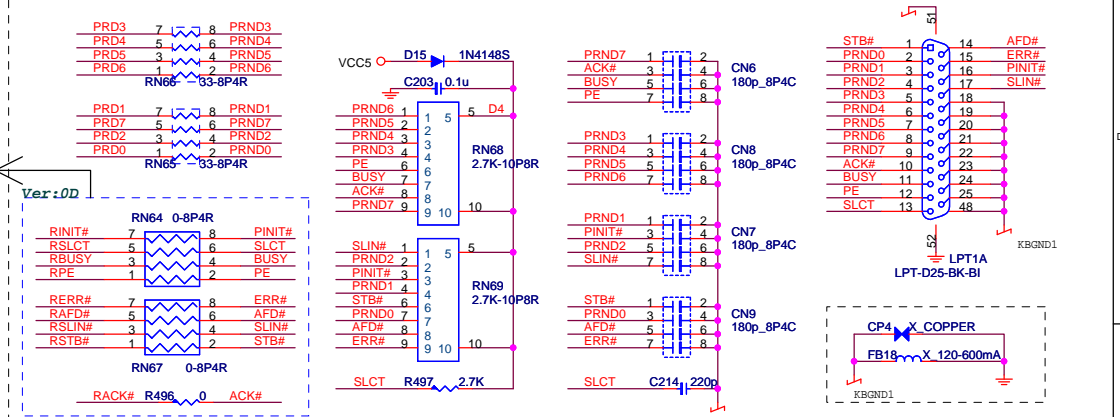
Size: Document Number **(MS-7024)** Rev 130

Date: Wednesday, December 08, 2004 Sheet 10 of 29

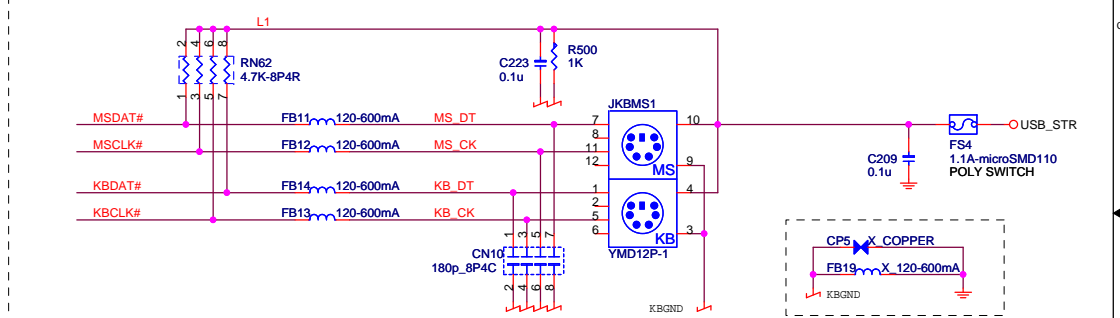
LPC SUPER I/O LPC47M233



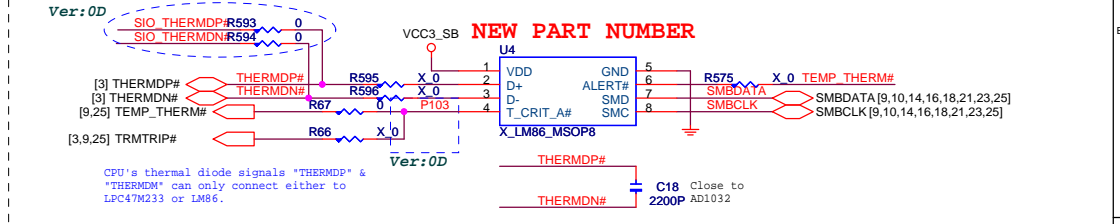
PARALLAL PORT



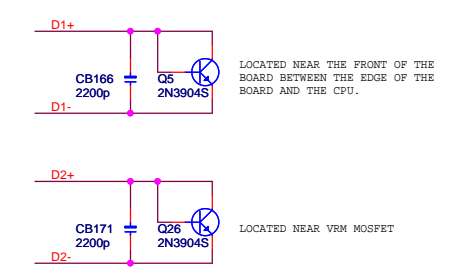
PS2 KEYBOARD & MOUSE CONNECTOR



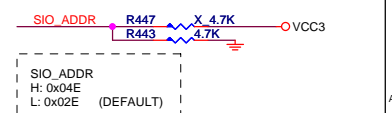
ADI 1032 TEMPERATURE SENSOR



REMOTE TEMPERATURE SENSOR



STRAPPING RESISTOR



MSI

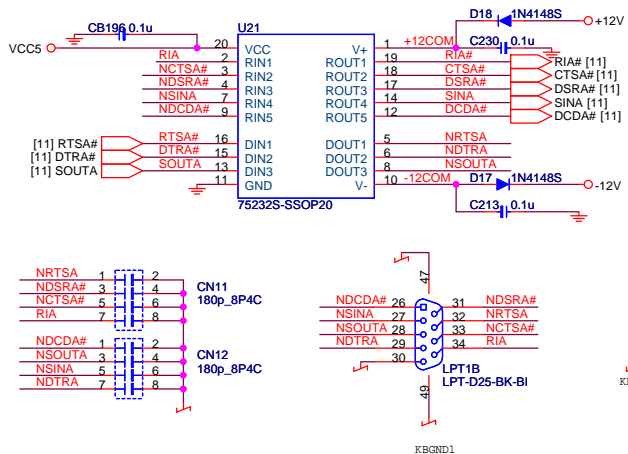
MICRO-STAR IN'L CO., LTD.

Title: **LPC SUPER I/O & CONNECTORS**

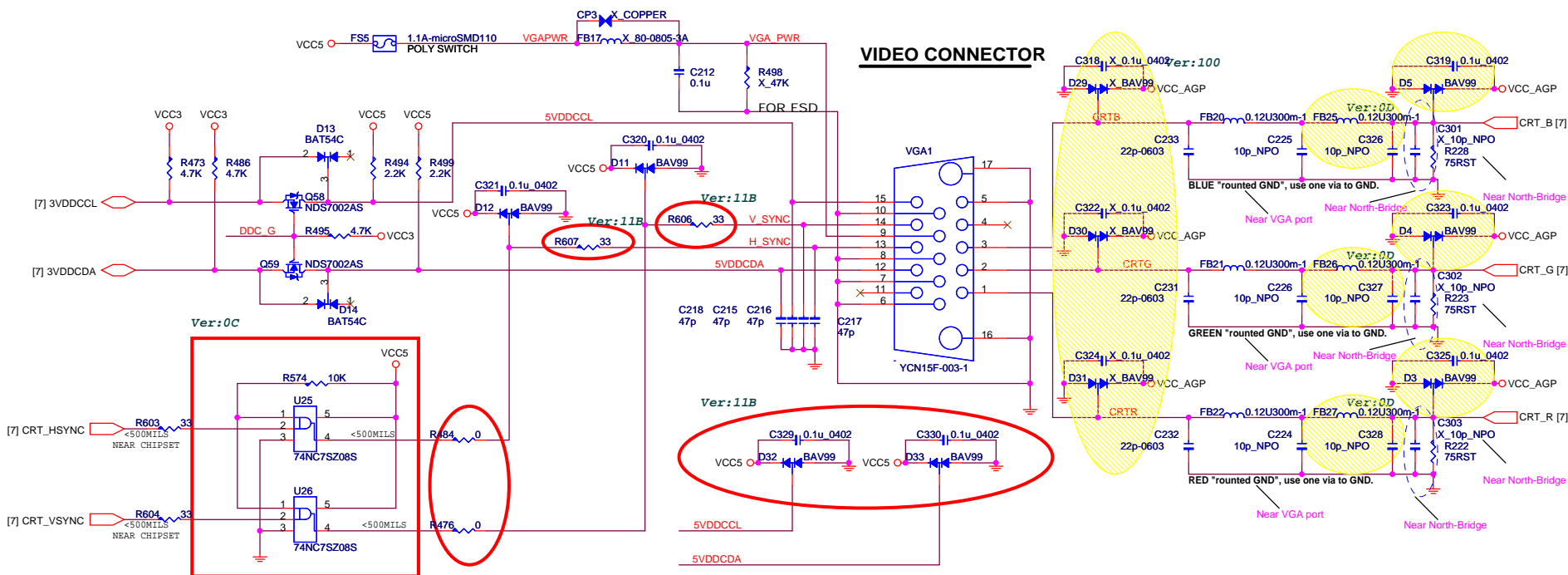
Size	Document Number	Rev
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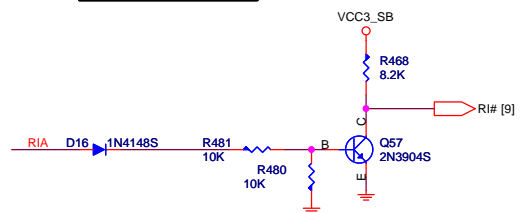
SERIAL PORT 1



VIDEO CONNECTOR



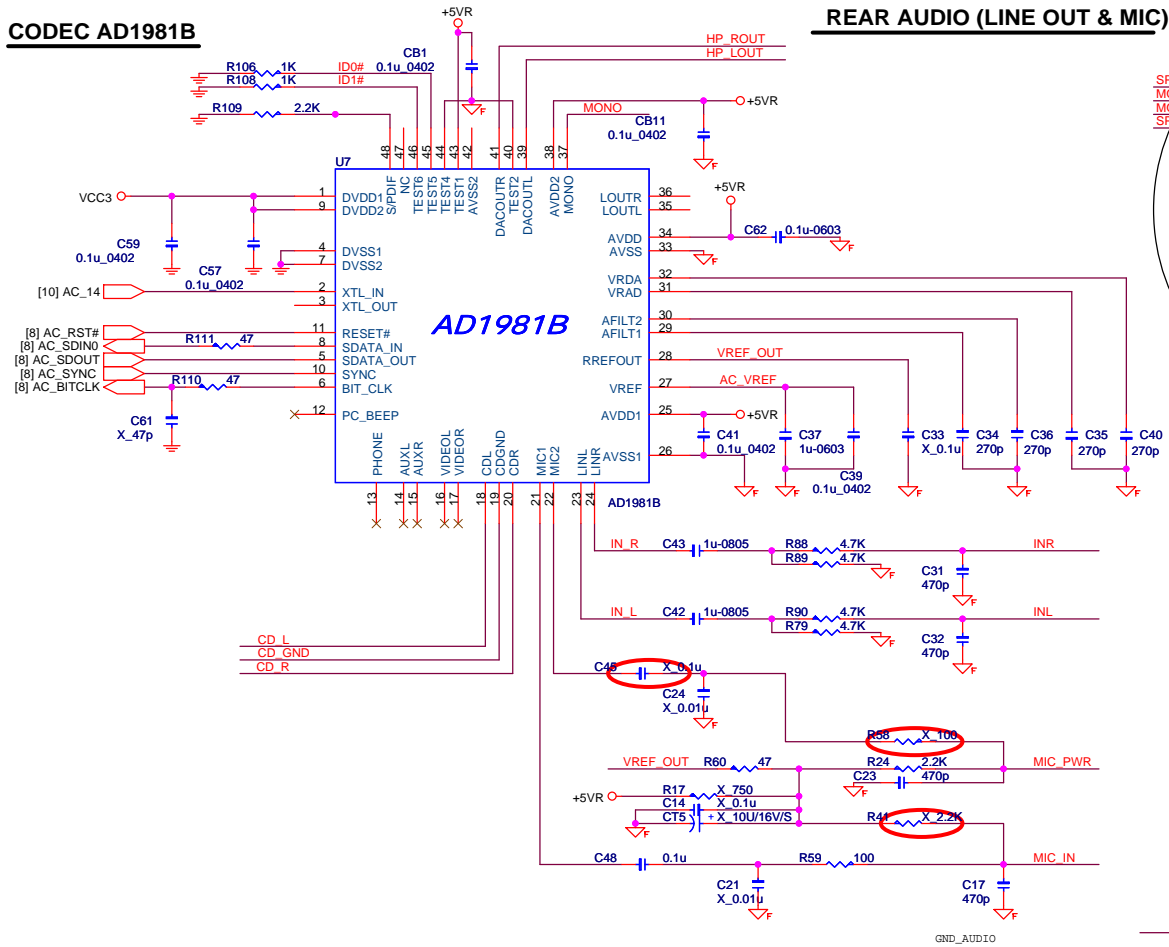
Wake On Ring



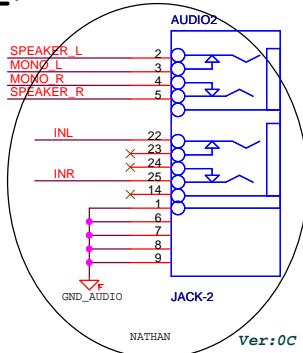
MICRO-STAR IN'L CO., LTD.

Title		
COM PORT & VGA CONNECTORS		
Size	Document Number	Rev
	(MS-7024)	130
Date:	Wednesday, December 08, 2004	Sheet 12 of 29

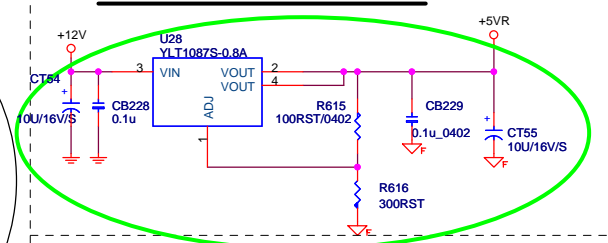
CODEC AD1981B



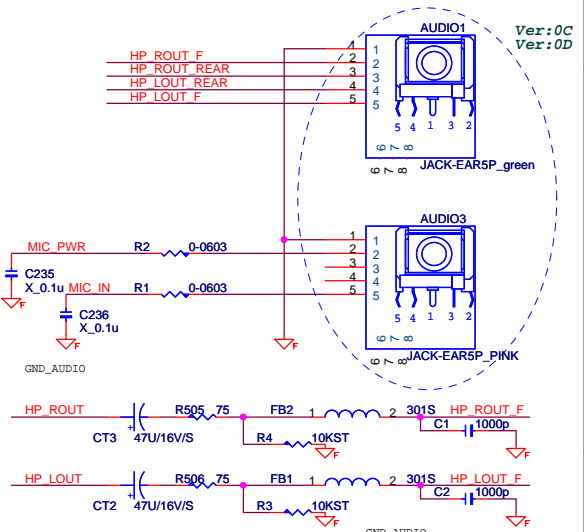
REAR AUDIO (LINE OUT & MIC)



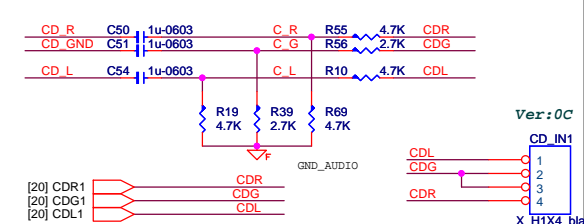
AUDIO CODE REGULATORS



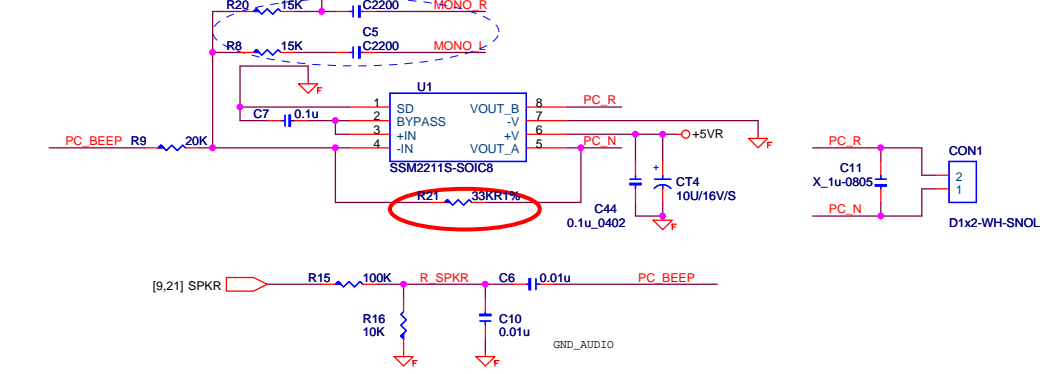
FRONT AUDIO CONNECTOR (LINE OUT & MIC)



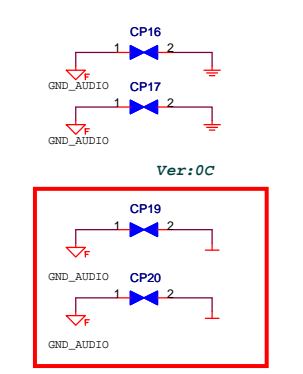
CD IN



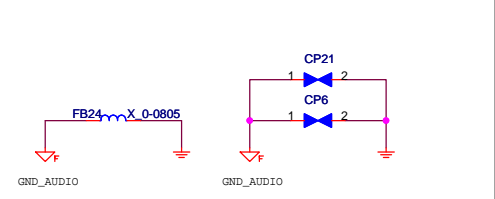
Internal Speaker



EMI COPPER



COPPER



MSI MICRO-STAR INT'L CO., LTD.

Title: **AC97 AUDIO - AD1981A/B**

Size: Document Number **(MS-7024)** Rev: 130

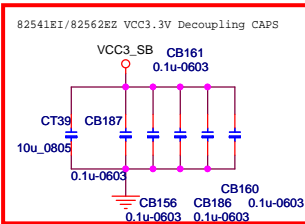
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B06-562E05-I06
 Controller, LAN, INTEL/Kinnereth-R, BGA-196pin, 10/100 MBPS Ethernet Controller
 B06-8254115-I06
 CHIP, LAN, INTEL/82541EI, BGA-196, 1.2V/1.8V/3.3V, 10/100/1000 MBPS Gigabit Ethernet Controller

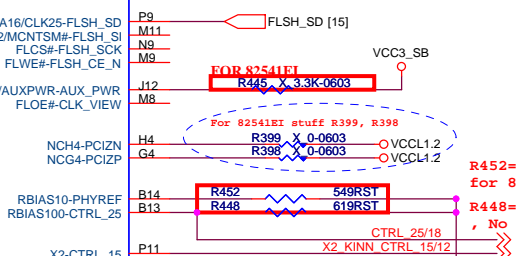
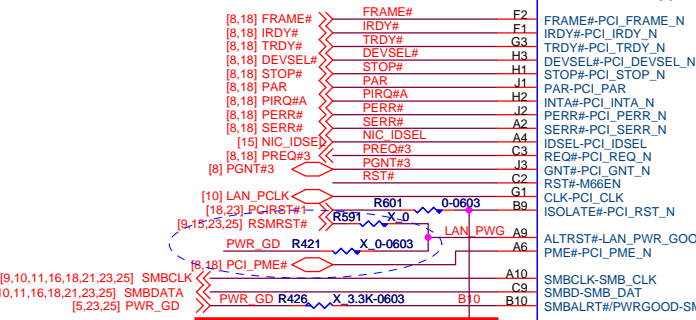
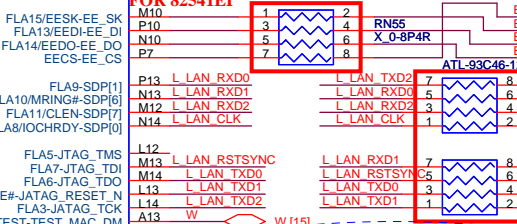
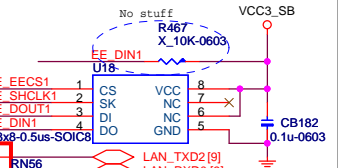
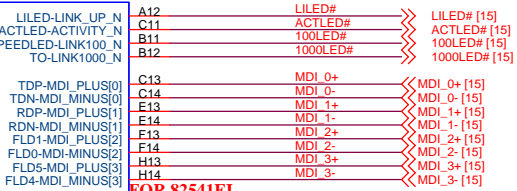
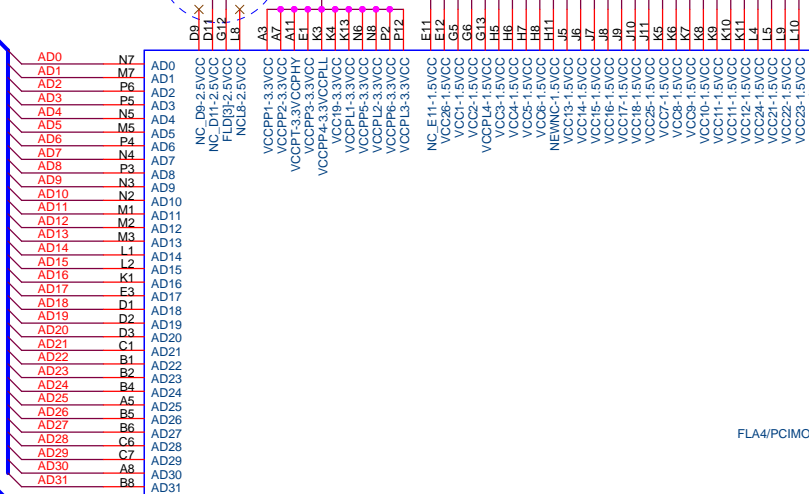
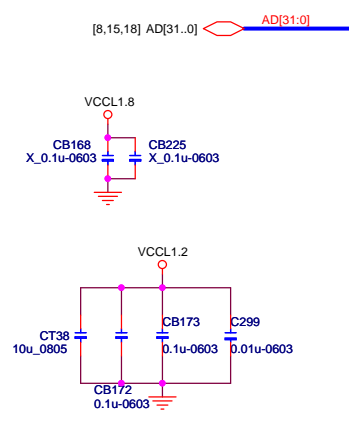
FOR 82541EI
FOR 82562EZ

1.8V RAIL ONLY REQUIRED WITH 82541EI CONTROLLER. NOT CONNECTED WITH 82562EZ

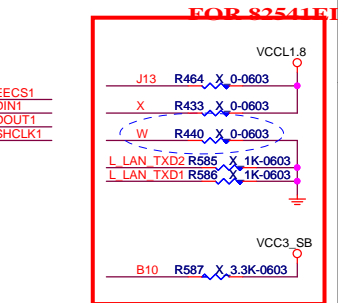
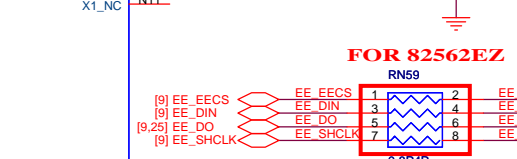
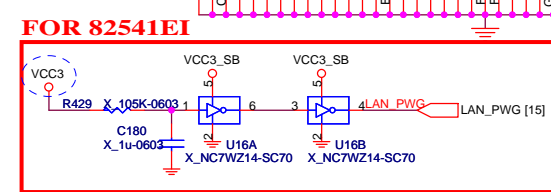
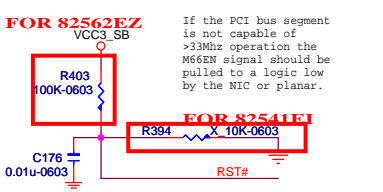
1.2V RAIL ONLY REQUIRED WITH 82541EI CONTROLLER



- Reference Document:**
1. 82540EP/82541GI(EI) & 82562EZ(EX) Dual Footprint Design Guide. (AP-444)
 2. 82541PI/EI/GI - 82551ER - 82562EZ Reference Design Rev2.1 (1/2)
 3. 82547EI -82562EX Reference Design Rev2.1. (10/15/03)
 4. ICHx Integrated LAN Controller Function Disable and Power Control for Fast Ethernet. (AP-417)

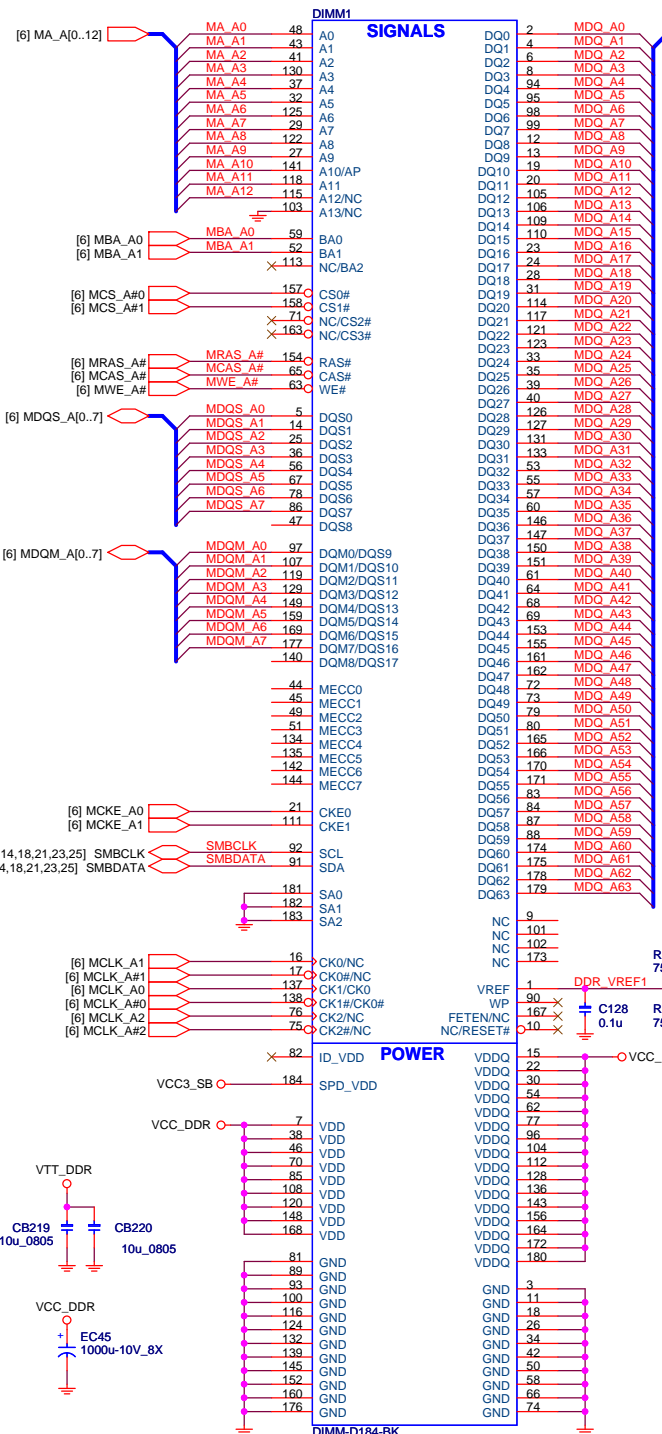


R452=549 ohm for 82562EZ, 2.49K ohm for 82540EM, No stuff for 82541EI.
 R448= 619 ohm 1% for 82562EZ, No stuff for 82541EI
 CTRL_25/18 [15] CTRL_25/18 [15]
 X2_KINN_CTRL_15/12 [15] X2_KINN_CTRL_15/12 [15]

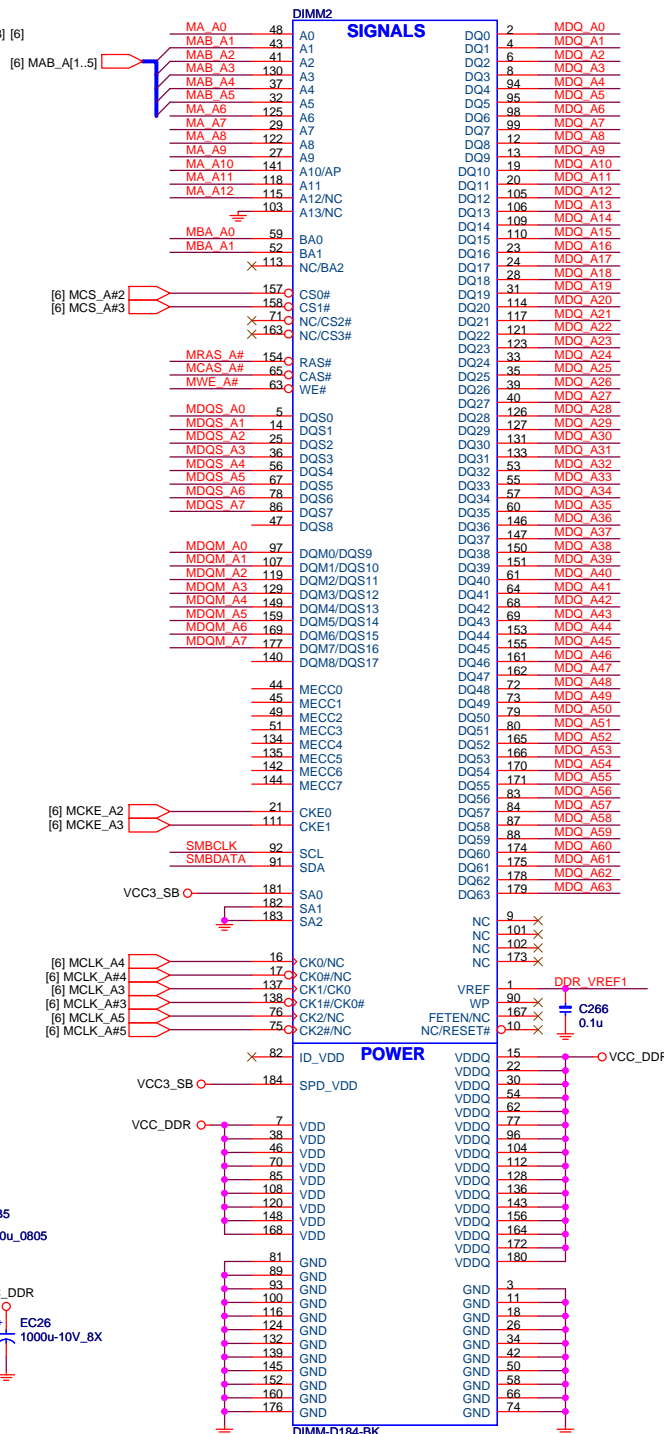


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 File all if using SPI EEPROM devices.
LAN Intel 82562EZ(10/100) / 82541EI(Giga)
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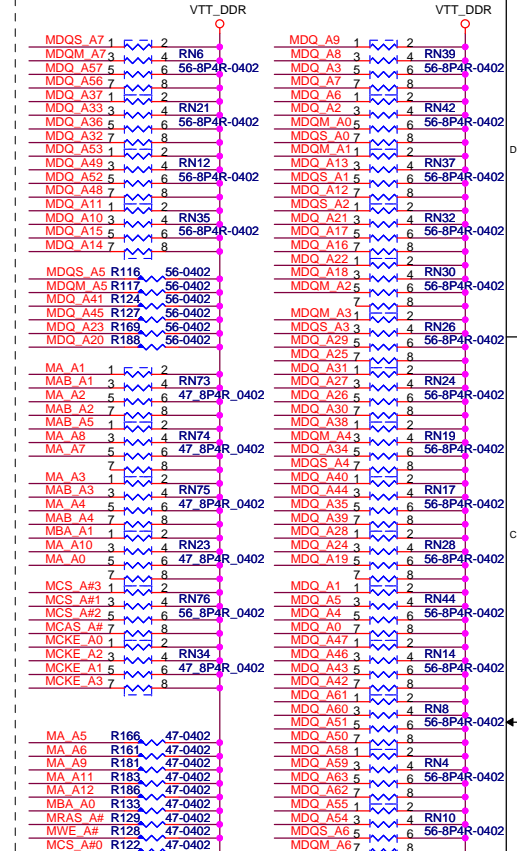
DDR DIMM1



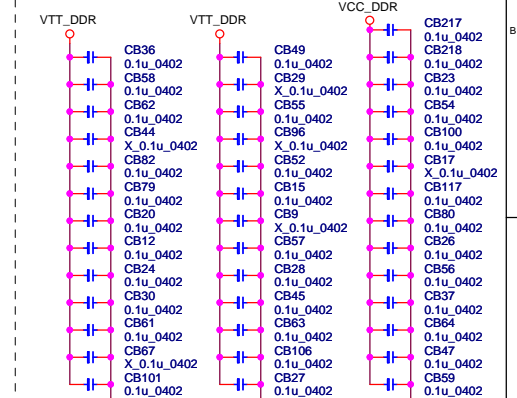
DDR DIMM2



DDR Termination Resistors



DECOUPLING CAPACITORS



Place these decoupling capacitors close to VTT_DDR termination resistors. One decoupling capacitor for each R-pack.

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Title: **DDR DIMM 1,2**

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5

4

3

2

1

D

D

C


C

B

B

A

A

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Title		BLANK	
Size	Document Number	Rev	
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5

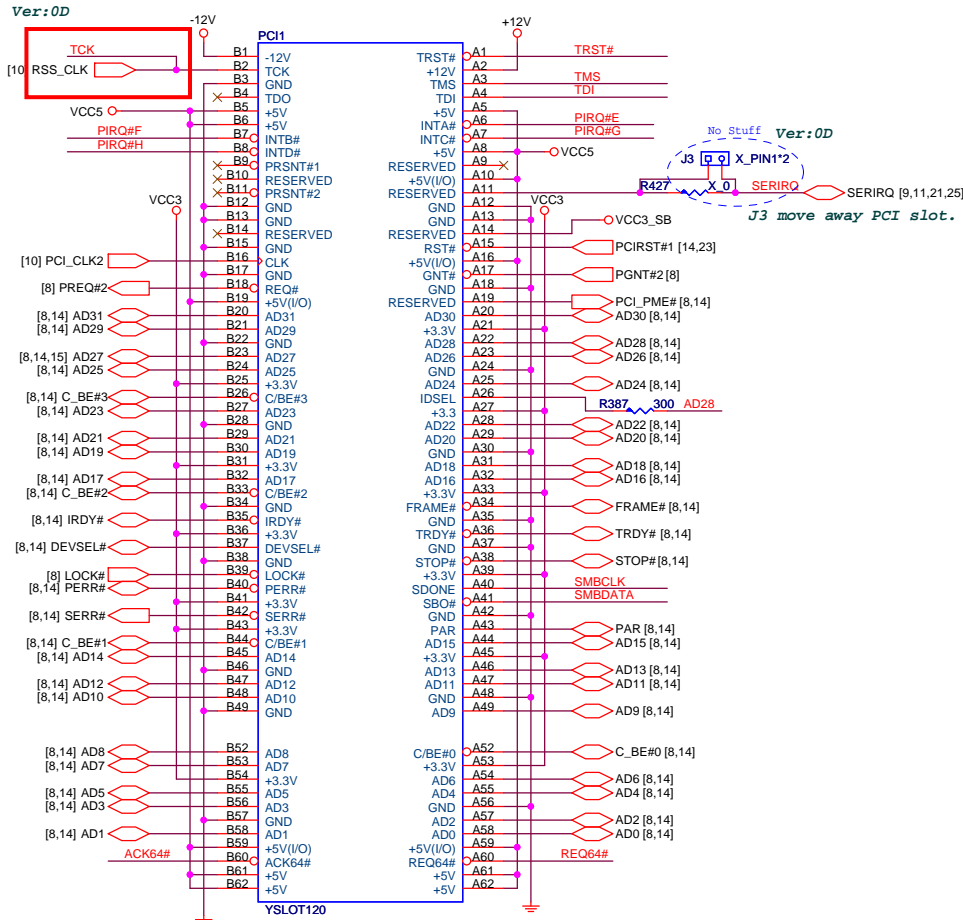
4

3

2

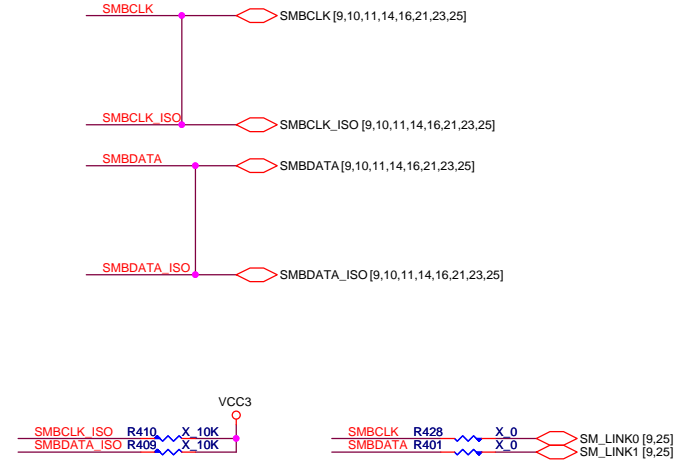
1

PCI RISER SLOT (PCI VER: 2.2 COMPLY)

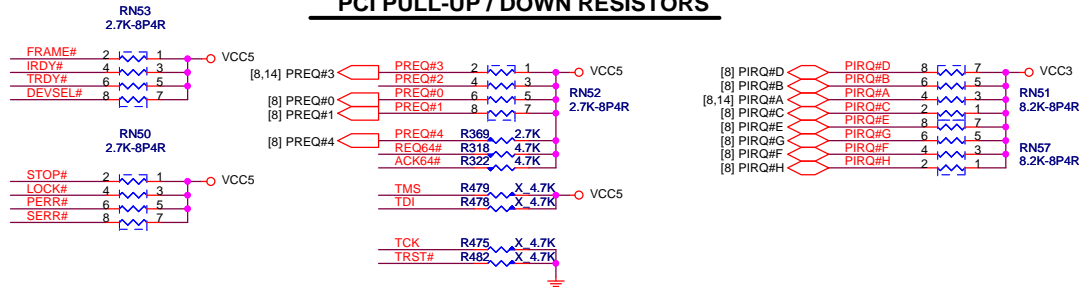


IDSEL = AD28
MASTER = PREQ#2
PIRQ#E

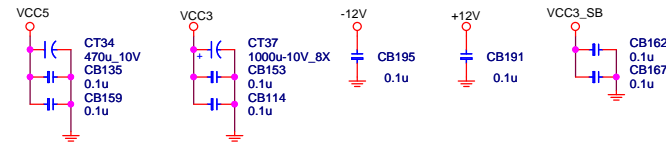
SMBus Isolation



PCI PULL-UP / DOWN RESISTORS



PCI SLOT DECOUPLING CAPACITORS

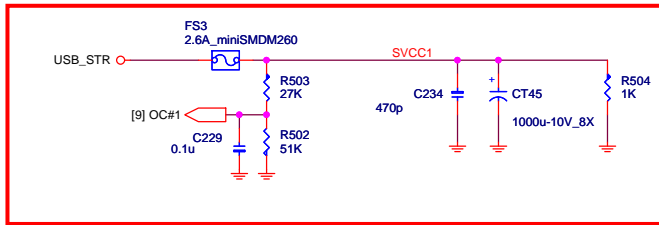


MSI MICRO-STAR INT'L CO., LTD.

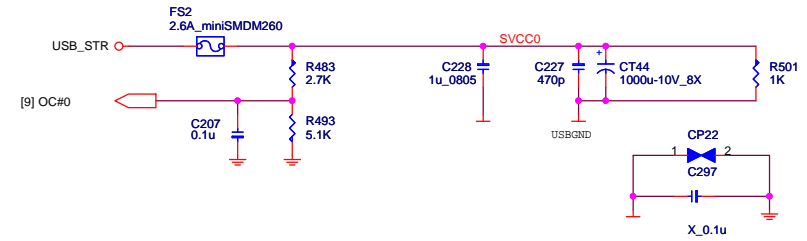
Title		PCI Slot	
Size	Document Number	(MS-7024)	
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POWER CIRCUIT FOR USB PORT 4,5,6,7

Ver: 0B

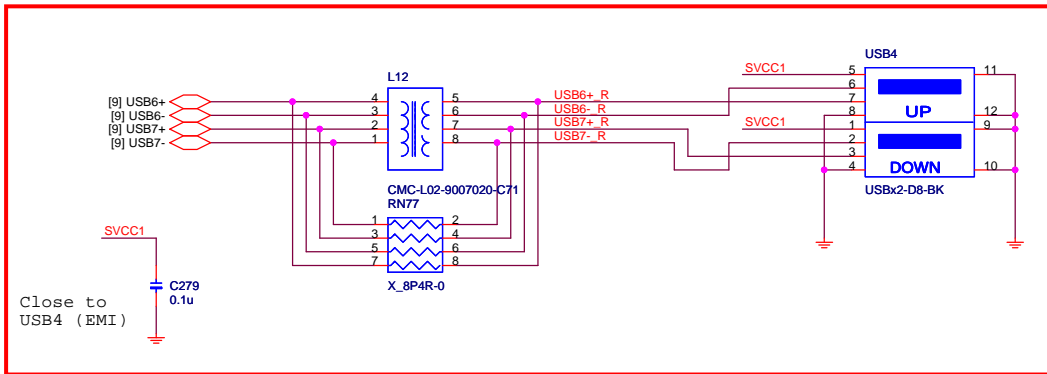


POWER CIRCUIT FOR USB PORT 0,1,2,3

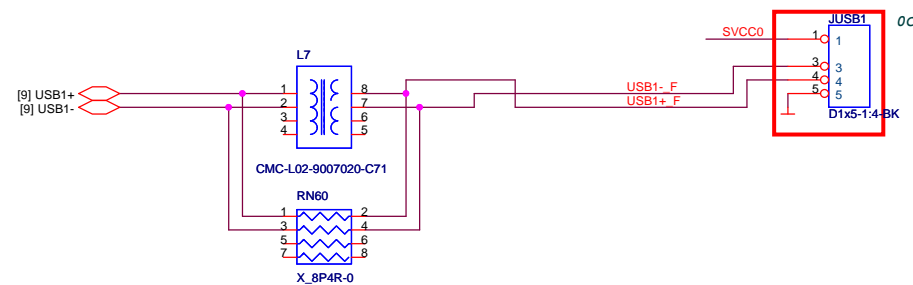


REAR PANEL USB CONNECTOR FOR USB PORT 6,7

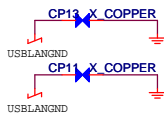
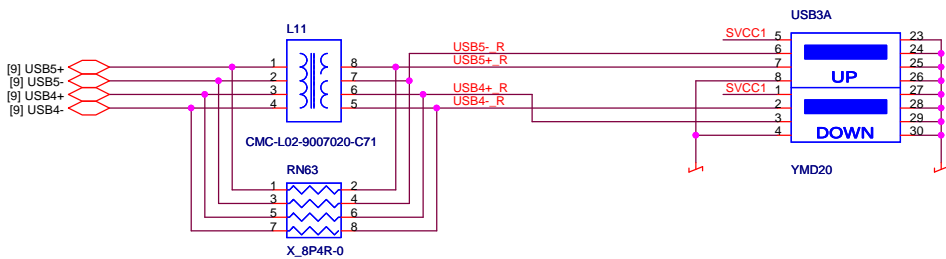
0B



FRONT PANEL USB CONNECTOR FOR USB PORT 0,1

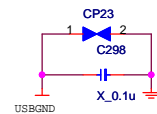
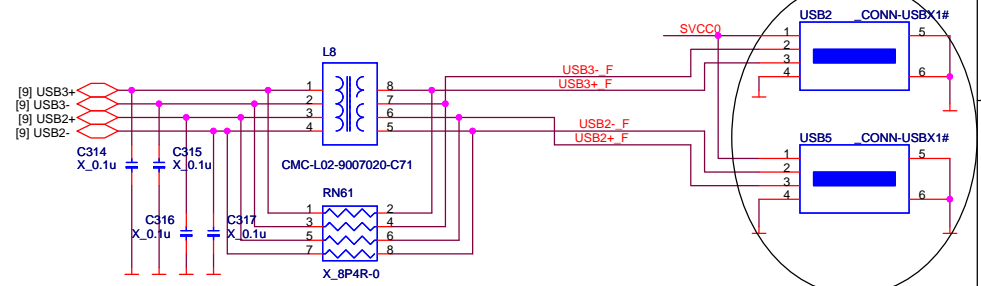


REAR PANEL USB CONNECTOR FOR USB PORT 4,5



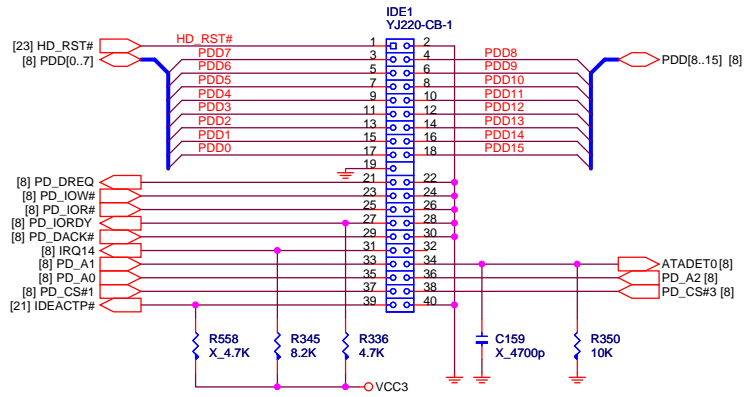
FRONT PANEL USB CONNECTOR FOR USB PORT 2,3

0C



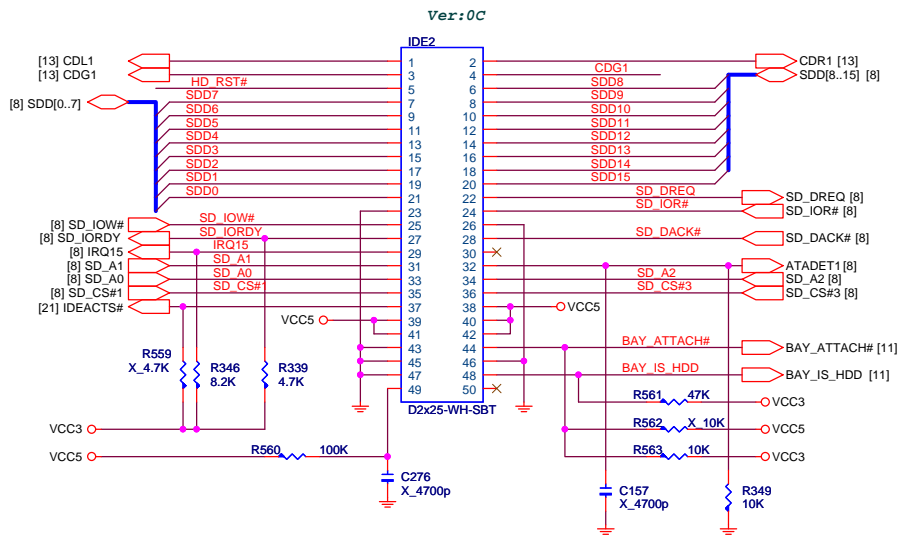
MICRO-STAR INT'L CO., LTD.		
Title H/W Monitor & FAN & USB Connectors		
Size	Document Number	Rev
	(MS-7024)	130
Date:	Wednesday, December 08, 2004	Sheet 19 of 29

PRIMARY IDE BLOCK

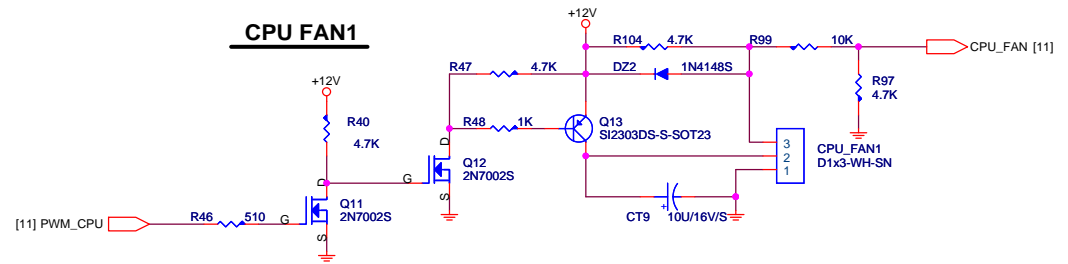


SECONDARY SLIME IDE

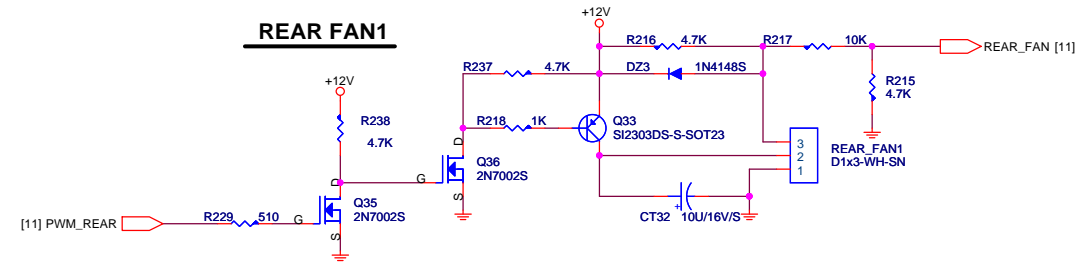
IBM Ultrabay Slim and Ultrabay Enhanced



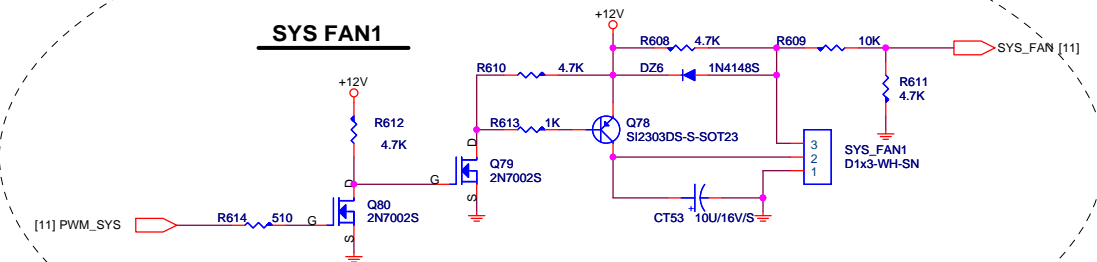
CPU FAN1



REAR FAN1



SYS FAN1



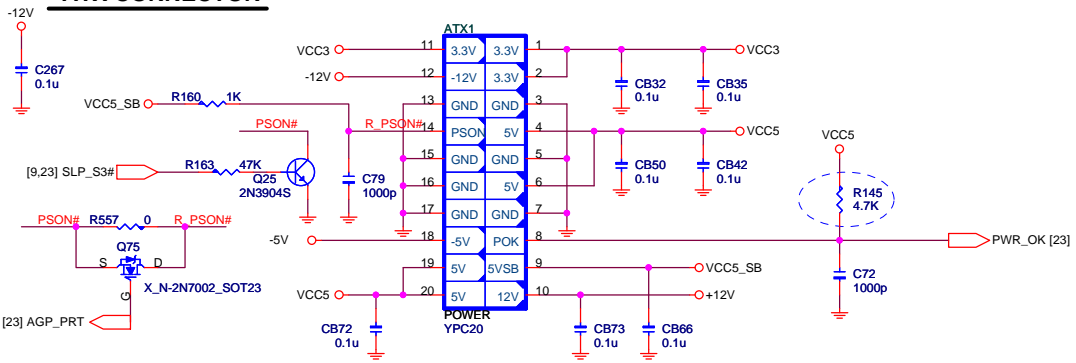
Ver: 1.3



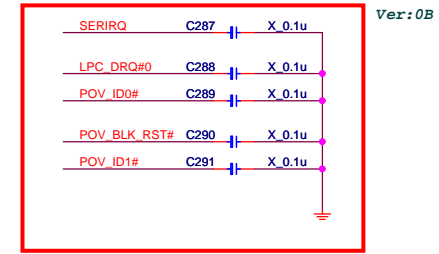
MICRO-STAR INT'L CO., LTD.

Title		ATA IDE & FAN CONNECTORS	
Size	Document Number	(MS-7024)	
Date:	Wednesday, December 08, 2004	Sheet	20 of 29
			Rev 130

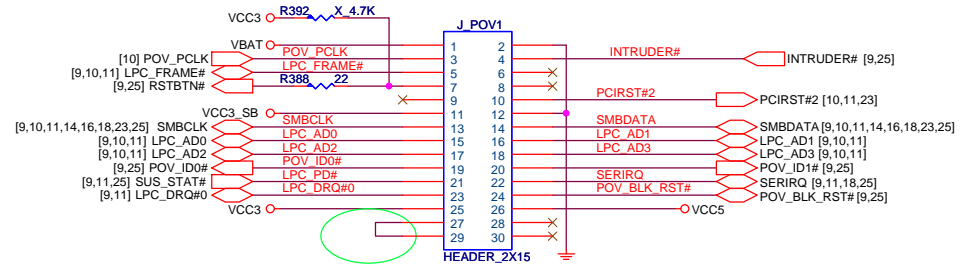
ATX CONNECTOR



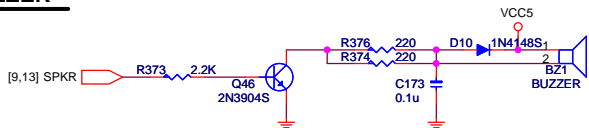
EMI Reserve



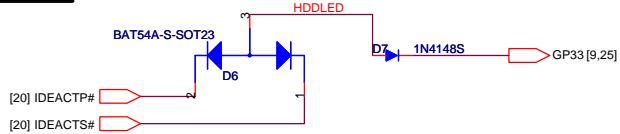
POV3 CONNECTOR



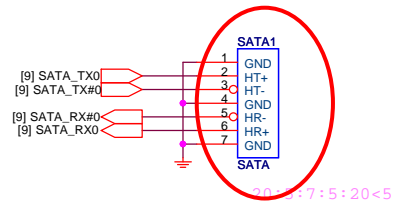
BUZZER



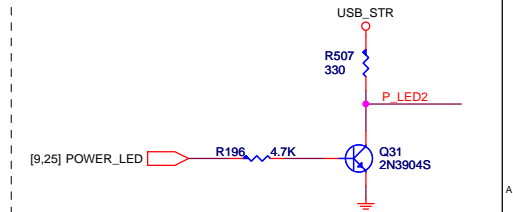
IDE LED



SERIAL ATA CONNECTOR BLOCK

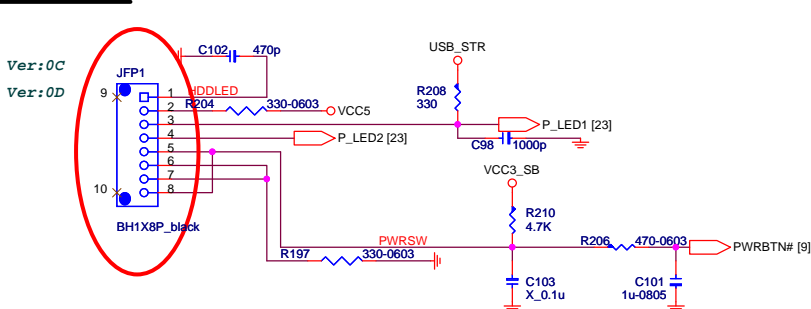


POWER LED



FRONT PANEL

NATHAN



MSI MICRO-STAR IN'L CO., LTD.

Title: **ATX & FRONT PANEL & POV3**

Size: Document Number **(MS-7024)** Rev 130

Date: Wednesday, December 08, 2004 Sheet 21 of 29

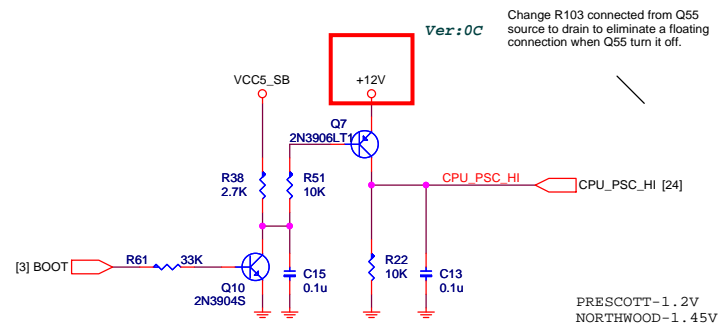
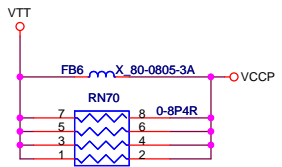
GMCH_VTT ON/OFF CIRCUIT

GMCH VCC_DAC Voltage Supplier

Intel reference GMCH VTT power circuit

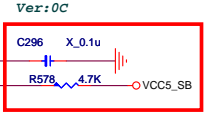
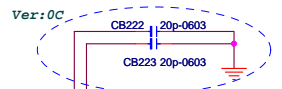
GMCH VTT Generator

NW/ PSC Load Line Selection

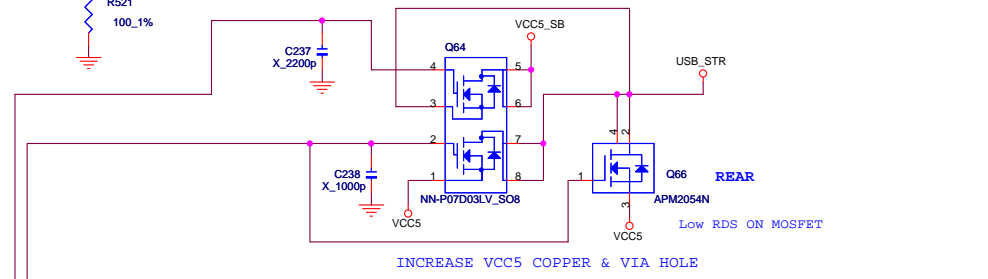


3VSB MODE SELECT

3VSB MODE	3VDLDEC#
SINGLE MOSFET	PULL HIGH
DUAL MOSFET	PULL LOW

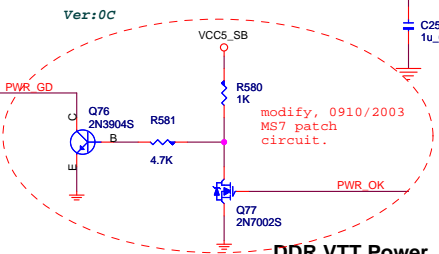
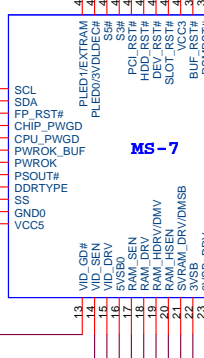
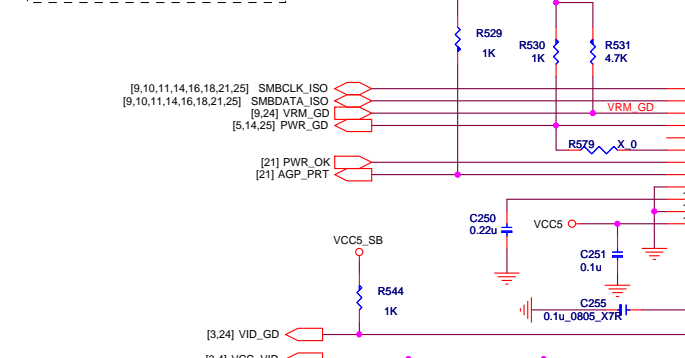


5V DUAL Power



VDIMM LINEAR OR PWM SELECT

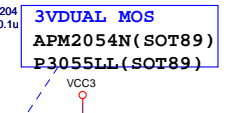
VDIMM MODE	EXTRAM
LINEAR REGULATOR	PULL LOW
PWM REGULATOR	PULL HIGH



DDR VTT Power

	VCCM
DDR400 & above	2.6V
DDR333	2.5V

WIDE TRACE



3VDUAL MOS
APM2054N (SOT89)
P3055LL (SOT89)

SWITCH:
D03-40N030B-A36
D03-20N030B-I14
D03-45N030B-P03
Regulator (TO-252)

Regulator (TO-252)
D03-45N020B-N03
D03-40N030B-A36
D03-6530A0B-F01
Regulator (TO-263)
D03-50N034B-N03
D03-50N031B-P03

SWITCH:
D03-40N030B-A36
D03-20N030B-I14
D03-45N030B-P03
Regulator (TO-252)
D03-50N034B-N03
D03-50N031B-P03
Dual NMOS
D03-07D0303-N03
D03-0731303-A30
3VDUAL MOS
APM2054N
P3055LL

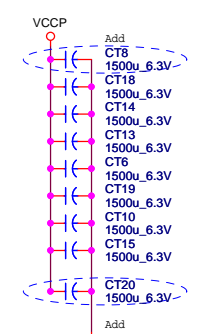
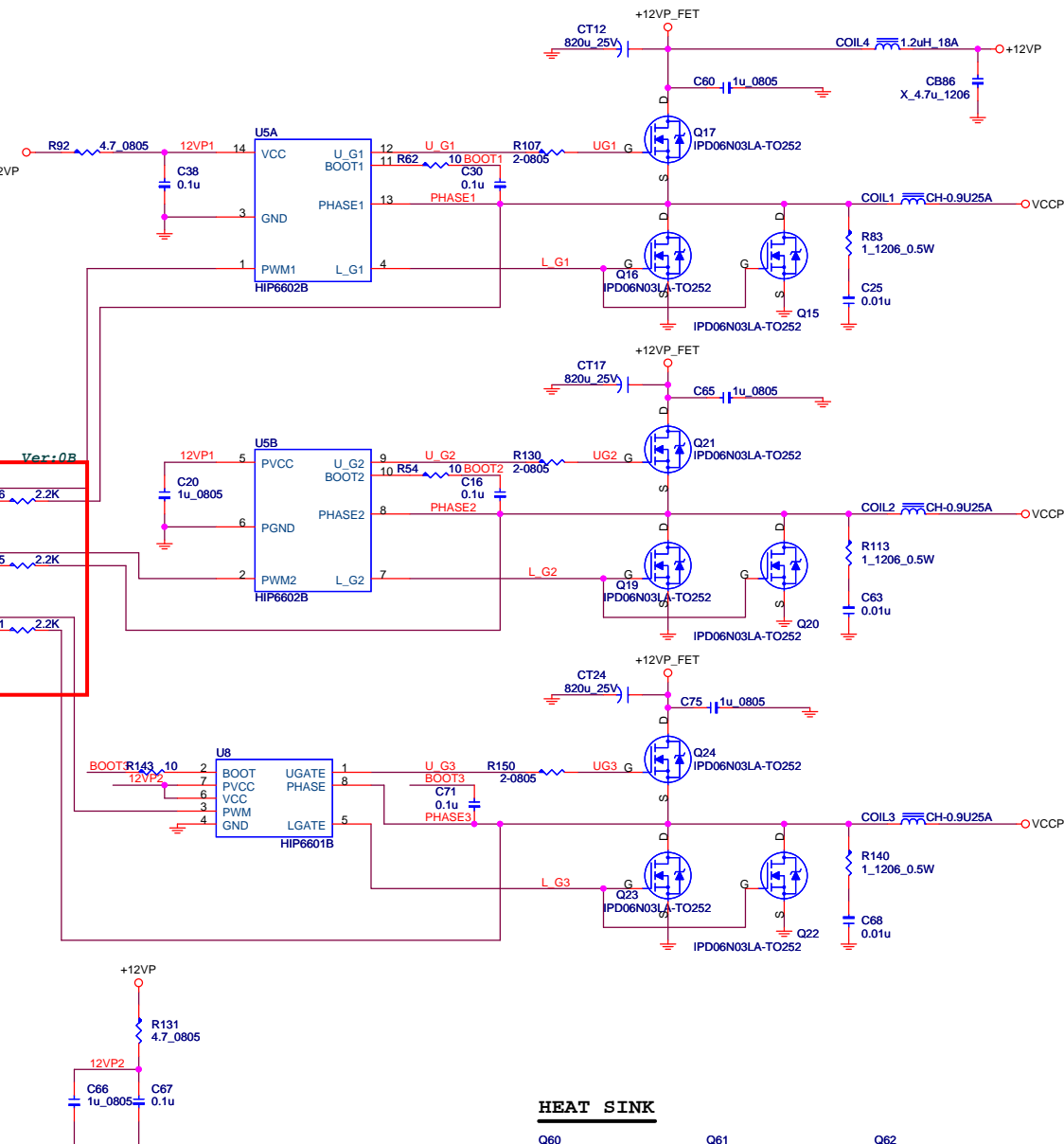
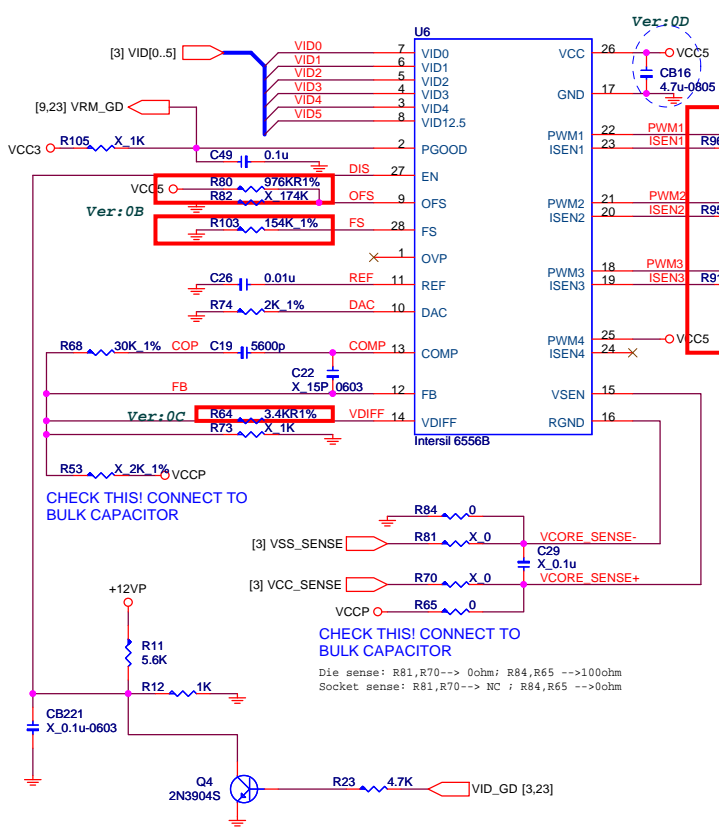
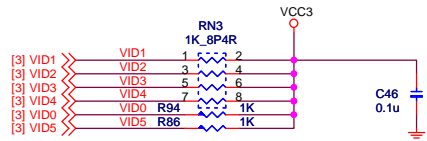
MICRO-STAR INT'L CO., LTD.

Title: ACPI (MS-7)

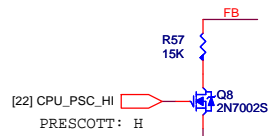
Size: Document Number: (MS-7024) Rev: 130

Date: Wednesday, December 08, 2004 Sheet: 23 of 29

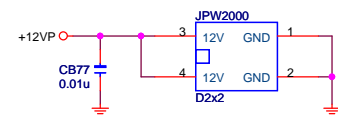
VID Pull-Up Resistor



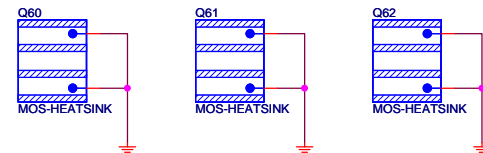
NORTHWOOD/PRESCOTT LOAD LINE SELECTOR



Ver:0D R57, Q8: Can be NC, if customer don't care northwood loadline. (Currently, Intel only measure PSC loadline.)

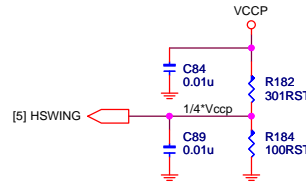
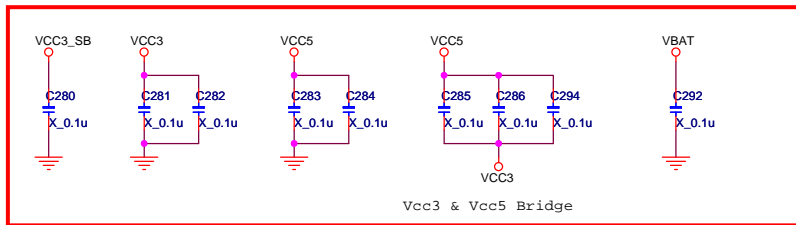


HEAT SINK



		MICRO-STAR IN'L CO., LTD.	
Title: VRM 10 - Intersil 6556B			
Size:	Document Number:	(MS-7024)	
Date:	Wednesday, December 08, 2004	Sheet:	24 of 29
			Rev: 130

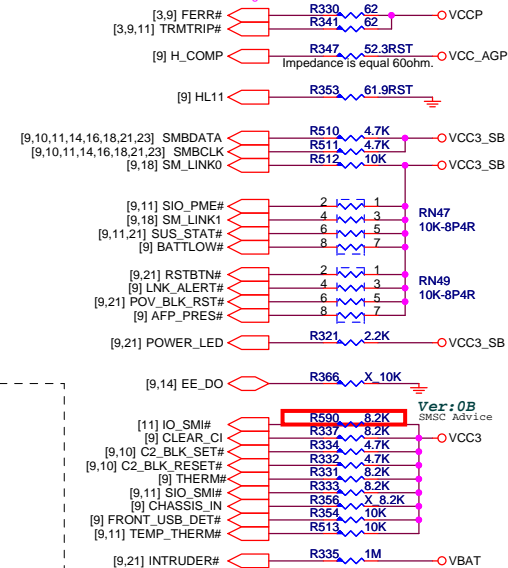
EMI Decoupling CAP



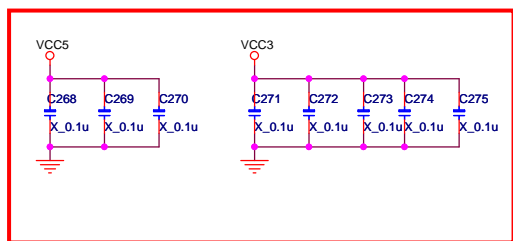
ICH5 STRAPPING RESISTORS

ALL COMPONENTS CLOSE TO ICH5

Trace length is less than 3inchs to ICH5.



Decoupling CAP



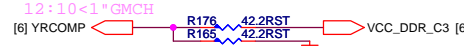
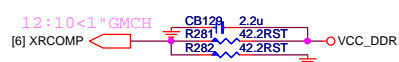
5VREF Sequencing Circuit



CLEAR CMOS JUMPER

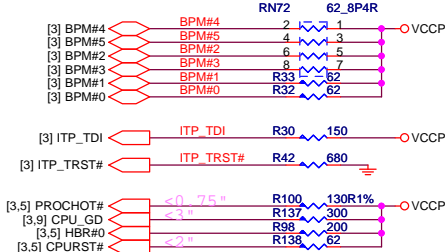


CMOS	CLEAR	NORMAL	CLEAR
JBAT1	(1-2)		(2-3)

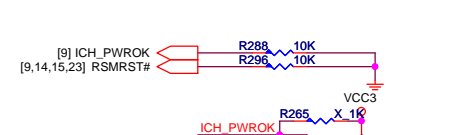
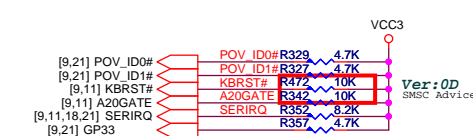
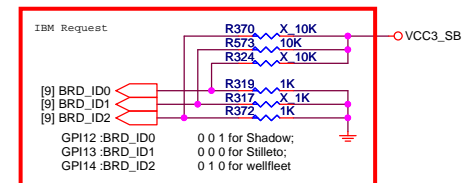
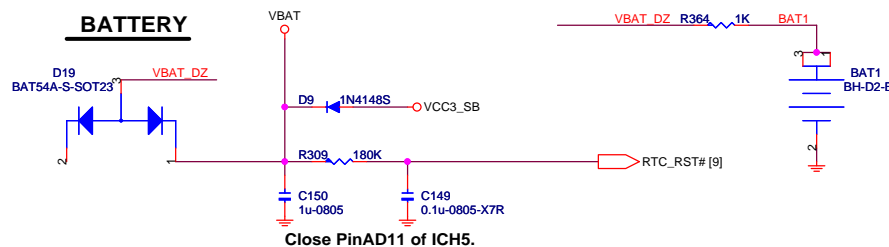


CPU STRAPPING RESISTORS

ALL COMPONENTS CLOSE TO CPU



BATTERY



MSI MICRO-STAR IN'L CO., LTD.

Title: CPU & GMCH & ICH5 PULL UP / DOWN RESISTORS

Size: Document Number (MS-7024) Rev: 130

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ICH5

GPIO Pin	Type	Function
GPIO 0	I	ATADET0 (multifunction pin)
GPIO 1	I	Unused (multifunction pin)
GPIO 2	I	PCI_IRO#E (multifunction pin)
GPIO 3	I	PCI_IRO#F (multifunction pin)
GPIO 4	I	PCI_IRO#G (multifunction pin)
GPIO 5	I	PCI_IRO#H (multifunction pin)
GPIO 6	I	POV_ID0# (multifunction pin)
GPIO 7	I	POV_ID1# (multifunction pin)
GPIO 8	I	SIO_PME# (multifunction pin)
GPIO 9	I	USB_OC2# (multifunction pin)
GPIO 10	I	USB_OC2# (multifunction pin)
GPIO 11	I	TEMP_THERM# (multifunction pin)
GPIO 12	I	BRD_ID0 (multifunction pin)
GPIO 13	I	BRD_ID1 (multifunction pin)
GPIO 14	I	BRD_ID2 (multifunction pin)
GPIO 15	I	USB_OC3# (multifunction pin)
GPIO 16	O	Unused (multifunction pin)
GPIO 17	O	Unused (multifunction pin)
GPIO 18	O	Unused (multifunction pin)
GPIO 19	O	CLEAR_C1 (multifunction pin)
GPIO 20	O	C2_BLK_RESET# (multifunction pin)
GPIO 21	O	C2_BLK_SET# (multifunction pin)
GPIO 22	O(OD)	SIO_SMI# (multifunction pin)
GPIO 23	O	CHASSIS_IN (multifunction pin)
GPIO 24	I/O	Unused (multifunction pin)
GPIO 25	I/O	POWER_LED (multifunction pin)
GPIO 27	I/O	POV_BLK_RST# (multifunction pin)
GPIO 28	I/O	ENET_DIS_N (multifunction pin)
GPIO 32	I/O	CLEAR_CMOS# (multifunction pin)
GPIO 33	I/O	Unused (multifunction pin)
GPIO 34	I/O	Unused (multifunction pin)
GPIO 40	I	PREQ#4 (multifunction pin)
GPIO 41	I	Unused (multifunction pin)
GPIO 48	O	PGNT#4 (multifunction pin)
GPIO 49	O	CPU_GD (multifunction pin)

Flash ROM(PCB REVISION ID)

GPIO Pin	Type	OA	OB	OC	
GPI 0	I	0	1	0	
GPI 1	I	0	0	1	
GPI 2	I	0	0	0	
GPI 3	I	0	0	0	
GPI 4	I	H: 10/100 ETHERNET L: GIGABIT ETHERNET LAN			

PCI Config.

DEVICE	MCP1 INT Pin	REQ#/GNT#	IDSEL	CLOCK	CLK GEN PIN OUT
PCI Riser Slot	PIRQE	PCI_REQ#2	AD28	PCICLK2	7 (PCI_CLK2)
	PIRQF	PCI_GNT#2		PCICLK1	8 (PCI_CLK1)
	PIRQG	PCI_REQ#4			
	PIROH	PCI_GNT#4			

LPC Super I/O

GPIO Pin	Type	Function
GPIO 10	I	BAY_ATTACH#
GPIO 11	I	BAY_IS_HDD
GPIO 12	I	Unused
GPIO 13	I	Unused
GPIO 14	I	Unused
GPIO 15	I	Unused
GPIO 16	I/O	Unused
GPIO 17	I/O	Unused
GPIO 20	I/O	Unused
GPIO 21	I/O	DSB#
GPIO 22	I/O	MOB#
GPIO 24	I/O	SIO_ADDR
GPIO 25	I/O	Unused
GPIO 26	I	Unused
GPIO 27	I	IO_SMI#
GPIO 30	O	CPU_FAN1
GPIO 31	O	REAR_FAN1
GPIO 32	I/O	PWM_CPU
GPIO 33	I/O	PWM_REAR
GPIO 34	O	Unused
GPIO 35	I/O	Unused
GPIO 36	O	KBRST#
GPIO 37	O	A20GATE
GPIO 40	O	DRVDENO
GPIO 41	I/O	DRVDEN1
GPIO 42	O	SIO_PME#
GPIO 43	I	DDRC_LOCK_DIS
GPIO 50	I/O	RIB#
GPIO 51	I/O	DCDB#
GPIO 52	I	SINB
GPIO 53	I/O	SOUTB
GPIO 54	I/O	DSRB#
GPIO 55	I/O	RTSB#
GPIO 56	I/O	CTSB#
GPIO 57	I/O	DTRB#
GPIO 60	I/O	Unused
GPIO 61	I/O	Unused

DDR DIMM Config.

DEVICE	ADDRESS	CLOCK
DIMM 1	A0H	MCLK_A0/MCLK_A#0
		MCLK_A1/MCLK_A#1
		MCLK_A2/MCLK_A#2
DIMM 2	A2H	MCLK_B0/MCLK_B#0
		MCLK_B1/MCLK_B#1
		MCLK_B2/MCLK_B#2

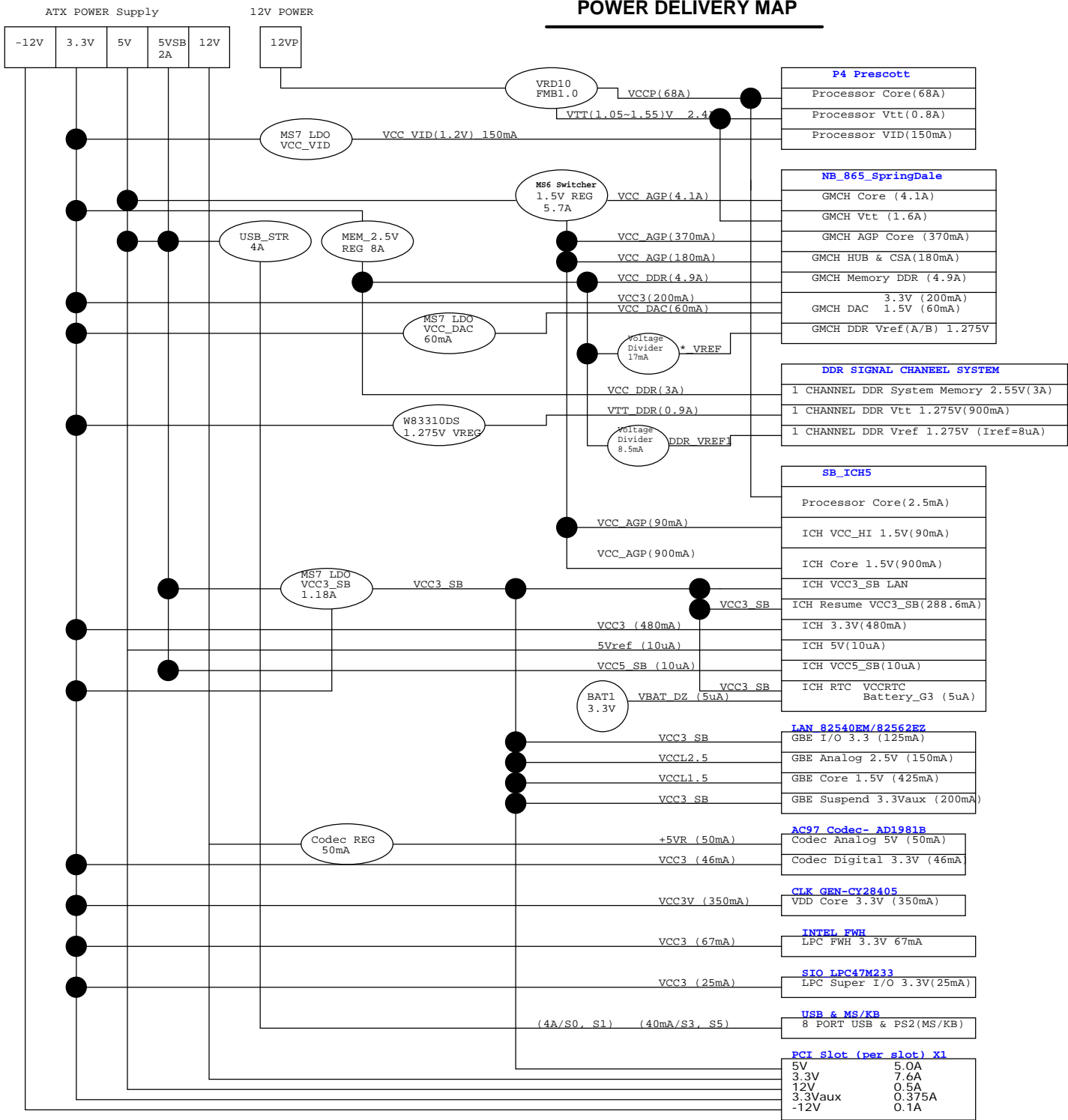
PCI RESET DEVICE

Signals	Target
PCIRST#1	PCI slot, LAN
PCIRST#2	Super I/O, FWH, POV3
PCIRST_ICH5#	Northbridge, MS-5
HDDRST#	Primary IDE

JUMPER SETTING

JBAT1	(1-2) NORMAL	(2-3) CLEAR
--------------	--------------	-------------

POWER DELIVERY MAP



VRM SPEC	Transition	Sustain	Power Consumption
VRM9.0	FMB1.0	60A	50A
	FMB2.0	70A	60A
VRM10.0	FMB1.0	78A	68A
	FMB1.5	91A	80A

P4 Prescott	
Processor Core	(68A)
Processor Vtt	(0.8A)
Processor VID	(150mA)

NB_865_Springdale	
GMCH Core	(4.1A)
GMCH Vtt	(1.6A)
GMCH AGP Core	(370mA)
GMCH HUB & CSA	(180mA)
GMCH Memory DDR	(4.9A)
GMCH DAC	3.3V (200mA) 1.5V (60mA)
GMCH DDR Vref(A/B)	1.275V

DDR SIGNAL CHANEEL SYSTEM	
1 CHANNEL DDR System Memory	2.55V(3A)
1 CHANNEL DDR Vtt	1.275V(900mA)
1 CHANNEL DDR Vref	1.275V (Iref=8uA)

SB_ICH5	
Processor Core	(2.5mA)
ICH VCC_HI	1.5V(90mA)
ICH Core	1.5V(900mA)
ICH VCC3_SB LAN	
ICH Resume VCC3_SB	(288.6mA)
ICH 3.3V	(480mA)
ICH 5V	(10uA)
ICH VCC5_SB	(10uA)
ICH RTC VCCRTC	
Battery_G3	(5uA)

LAN 82540EM/82562EZ	
GBE I/O	3.3 (125mA)
GBE Analog	2.5V (150mA)
GBE Core	1.5V (425mA)
GBE Suspend	3.3Vaux (200mA)

AC97 Codec- AD1981B	
Codec Analog	5V (50mA)
Codec Digital	3.3V (46mA)

CLK GEN-CY28405	
VDD Core	3.3V (350mA)

INTEL FW	
LPC FW	3.3V 67mA

SIO LPC47M233	
LPC Super I/O	3.3V(25mA)

USB & MS/KB	
8 PORT USB & PS2(MS/KB)	

PCI slot (per slot) X1	
5V	5.0A
3.3V	7.6A
12V	0.5A
3.3Vaux	0.375A
-12V	0.1A

MICRO-STAR INT'L CO., LTD.


Title: Power delivery map

Size: Document Number (MS-7024) Rev 130

Date: Wednesday, December 08, 2004 Sheet 27 of 29

MS-7024 Revision History List			
Ver.	DATE	Schematic Change List	Page
0A	2003.09.24	1. Create MS-7024 Project for IBM (Wellfleet) design.	
0B	2004.02.13 2004.02.20	1. Front 4 port USB change to 2 port USB. 2. Add JUSB1 pin header (1x5) for card reader.. 3. Add Rear 2 port USB connector. 4. Secondary Silm IDE change to IBM Ultrabay Slim and Ultrabay Enhanced spec. 5. Add Front_FAN1 for thermal issue reserve. 6. EMI coupling cap reserve. 7. Intel LAN Kinnereth / Kenai 2 EMI issue update.	P.19 P.19 P.19 P.19 P.20 P.21 P.25 P.14
0C	2004.02.13	1. Front panel spec update: Line-Out, MIC, USB, USB 2. Rear panel spec update: Line-Out, Line-In. 3. IBM Wellfleet broad ID circuit update. 4. IBM Wellfleet Logo location update. 5. POV3 card mechanical issue with C128, JBAT1. 6. Video sink buffers circuit added in. 7. IEEE 10/100/1000 LAN solution update.	Layout P.13 Layout Layout P.12
0D	2004.03.31	1. Change LAN chipset for 82540EM to 82541EI. 2. Parallel port proposal from IBM suggestion change 33ohm to 0ohm. 3. Add RSS_CLK for IBM Retail Store Systems (RSS) group requirement. 4. Change H-sync and V-sync resistor value form 47ohm to 33ohm for EMI issue. 5. Add C301, C302, C303 cap at North-Bridge side for EMI concern.	P.14 P.15 P.11 P.10 P.11 P.12
0E	2004.04.30	1. Update 82541EI LAN Enable/Disable circuit. 2. Update component RSL0005 for IBM request. 3. Reserve SIO/GPIO pin for LAN enable/disable function used. 4. Change SATA connector with housing spec.	P.15 P.1 P.15 P.21
100	2004.05.20	1. Change R21 to 27Kohm for internal speaker small volume issue.	P.13
110	2004.06.25	1. Update mounting hole for EMI concern. 2. Reserve C314, C315, C316, C317 for USB EMI concern. 3. Change R8, R20 to 15Kohm, R21 to 33Kohm for internal speaker small olume issue.	P.19
11A	2004.07.21	1. Add RGB signal protection diode for No display issue. 2. Add L-C filter for RGB signal (Reference Intel Grantsdale suggestion).	P.12
11B	2004.07.23	1. Add DDCCL, DDCDA signal protection diode for No display issue. 2. Add serier resistor (R607, R606)on H-sync, Vsync signal at VGA connector and buffer side.	P.12
120	2004.08.27	1. Change to Ver.120	

Ver.	DATE	Schematic Change List
1.3	2004.11.12	1. Modify J_POV1 schematic (Slove password issue when using POV3), short pin 27 & 29 2. Change board ID (Just change the PCB Revision ID from 0000b to 0001b by pulling REV0 up (R414) instead of down (R413). 3. Add system FAN
1.3	2004.12.02	1. Change LM78L05-SOT89 to YLT1087S-0.8A for AUDIO regulator on page 13.

 MICRO-STAR INT'L CO., LTD.		
Title REVISION HISTORY		
Size	Document Number (MS-7024)	Rev 130
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